Final Overseas Environmental Impact Statement/ Environmental Impact Statement

UNDERSEA WARFARE TRAINING RANGE

Volume II

Lead Agency:
Department of the Navy

Action Proponent:
United States Fleet Forces Command

Cooperating Agency:
National Oceanic and Atmospheric Administration
National Marine Fisheries Service
1315 East-West Highway
Silver Spring, Maryland 20910-3226

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June 26, 2009

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Abstract: This final overseas environmental impact statement/environmental impact statement has been prepared by the Department of the Navy to address the impacts of the installation and operation of the proposed undersea warfare training range. The potentially affected areas of the preferred site (in the Jacksonville Operating Area) and of the alternative sites (within the Charleston, Cherry Point, and Virginia Capes Operating Areas) have been studied to determine how installation of and operation on the proposed undersea warfare training range would affect the marine and landside environments.

APPENDIX A

FISH SPECIES THAT MAY OCCUR IN SITES A, B, C, & D RANGE SITES AND/OR THE CABLE CORRIDORS

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A Fish Species That May Occur in Sites A, B, C, & D Range Sites and/or the Cable Corridors

Table A-1

Fish Species That May Occur in the Site A Range Site and/or the Cable Corridor

Common Name	Scientific Name	Vertical Habitat Category	Depth (m)	Cable and/or Range Overlap	Source
Acanthuridae					
ocean surgeon	*Acanthurus bahianus*	Reef	2-40	C/R	2, 5
doctorfish	*Acanthurus chirurgus*	Reef	2-25	C	2, 5
blue tang	*Acanthurus coeruleus*	Reef	2-40	C/R	2
Acipenseridae					
shortnose sturgeon	*Acipenser brevirostrum*	Demersal		C	5
Atlantic sturgeon	*Acipenser oxyrinchus oxyrinchus*	Demersal	0-46	C	6
Albulidae					
bonefish	*Albula vulpes*	Reef	0-84	C/R	5
Alopiidae					
thresher shark	*Alopias vulpinus*	Pelagic	0-550	C/R	5
Anguillidae					
American eel	*Anguilla rostrata*	Demersal	0-464	C/R	5
Antennariidae					
big-eyed frogfish	*Antennarius radiosus*	Demersal	20-275	C/R	4
sargassumfish	*Histrio histrio*	Reef	?-11	C	5
Apogonidae					
barred cardinalfish	*Apogon binotatus*	Reef	1-60	C/R	2
flamefish	*Apogon maculatus*	Reef	0-128	C/R	2
twospot cardinalfish	*Apogon pseudomaculatus*	Reef	1-100	C/R	2, 4
belted cardinalfish	*Apogon townsendi*	Reef	3-55	C/R	2
blackfin cardinalfish	*Astrapogon puncticulatus*	Reef	0-8	C	2
conchfish	*Astrapogon stellatus*	Reef	1-40	C/R	2
short bigeye	*Pristigenys alta*	Reef	5-200	C/R	4
Argentinidae					
striated argentine	*Argentina striata*	Bathypelagic	100-600	R	4
Ariidae					
hardhead catfish	*Ariopsis felis*	Reef		C/R	5
gafftopsail sea catfish	*Bagre marinus*	Demersal	0-50	C/R	5
Balistidae					
gray triggerfish	*Balistes capriscus*	Reef	0-100	C/R	2, 5
queen triggerfish	*Balistes vetula*	Reef	2-275	C/R	2, 5
ocean triggerfish	*Canthidermis sufflamen*	Reef	5-60	C/R	5

Table A-1 (cont'd)

Fish Species That May Occur in the Site A Range Site and/or the Cable Corridor

Common Name	Scientific Name	Vertical Habitat Category	Depth (m)	Cable and/or Range Overlap	Source
Batrachoididae					
Atlantic midshipman	*Porichthys plectrodon*	Demersal	?-100	C/R	4
oyster toadfish	*Opsanus tau*	Reef		C	5
Belonidae					
Atlantic needlefish	*Strongylura marina*	Reef	1-?	C	5
houndfish	*Tylosurus crocodilus crocodilus*	Reef	0-13	C	5
Blenniidae					
barred blenny	*Hypleurochilus bermudensis*	Reef	1-23	C	2
crested blenny	*Hypleurochilus geminatus*	Demersal	1-80	C/R	4
redlip blenny	*Ophioblennius atlanticus*	Reef	0-8	C	2
seaweed blenny	*Parablennius marmoreus*	Reef	0-10	C	2, 4
molly miller	*Scartella cristata*	Reef	0-10	C	2
Bothidae					
peacock flounder	*Bothus lunatus*	Reef	0-100	C/R	4
eyed flounder	*Bothus ocellatus*	Reef	1-110	C/R	3, 4
twospot flounder	*Bothus robinsi*	Demersal	?-90	C/R	3, 4
Bregmacerotidae					
antenna codlet	*Bregmaceros atlanticus*	Pelagic		C/R	3
stellate codlet	*Bregmaceros houdei*	Pelagic		C/R	3
Callionymidae					
spotted dragonet	*Diplogrammus pauciradiatus*	Reef		C	3, 4
Carangidae					
African pompano	*Alectis ciliaris*	Reef	60-100	R	5
yellow jack	*Caranx bartholomaei*	Reef	0-50	C/R	2, 4, 5
blue runner	*Caranx crysos*	Reef	0-100	C/R	2, 5
horse-eye jack	*Caranx latus*	Reef	0-140	C/R	5
crevalle jack	*Caranx hippos*	Reef	1-350	C/R	5
bar jack	*Caranx ruber*	Reef	0-35	C	2, 5
Atlantic bumper	*Chloroscombrus chrysurus*	Pelagic	?-55	C/R	4
mackerel scad	*Decapterus macarellus*	Pelagic	0-200	C/R	4
round scad	*Decapterus punctatus*	Reef	0-100	C/R	2, 4, 5
redtail scad	*Decapterus tabl*	Reef	?-400	C/R	5
rainbow runner	*Elagatis bipinnulata*	Reef	0-150	C/R	2, 3, 5
leatherjacket	*Oligoplites saurus*	Reef		C	5
bigeye scad	*Selar crumenophthalmus*	Reef	0-170	C/R	5

Table A-1 (cont'd)

Fish Species That May Occur in the Site A Range Site and/or the Cable Corridor

Common Name	Scientific Name	Vertical Habitat Category	Depth (m)	Cable and/or Range Overlap	Source
Atlantic moonfish	*Selene setapinnis*	Benthopelagic	?-55	C/R	5
lookdown	*Selene vomer*	Demersal	1-53	C/R	2, 5
greater amberjack	*Seriola dumerili*	Reef	1-360	C/R	1, 2, 5
lesser amberjack	*Seriola fasciata*	Benthopelagic	55-130	R	5
almaco jack	*Seriola rivoliana*	Reef	5-160	C/R	5
banded rudderfish	*Seriola zonata*	Benthopelagic		C/R	5
Florida pompano	*Trachinotus carolinus*	Benthopelagic	?-70	C/R	5
permit	*Trachinotus falcatus*	Reef	0-36	C	5
palometa	*Trachinotus goodei*	Reef	0-12	C	5
rough scad	*Trachurus lathami*	Reef	30-90	C/R	4, 5
Carcharhinidae					
blacknose shark	*Carcharhinus acronotus*	Reef		C/R	1, 5
spinner shark	*Carcharhinus brevipinna*	Reef	0-100	C/R	1, 5
silky shark	*Carcharhinus falciformis*	Reef	0-4000	C/R	1, 5
finetooth shark	*Carcharhinus isodon*	Demersal	?-100	C/R	1, 5
bull shark	*Carcharhinus leucas*	Reef	1-152	C/R	1, 5
blacktip shark	*Carcharhinus limbatus*	Reef	0-30	C	1, 5
oceanic whitetip shark	*Carcharhinus longimanus*	Reef	0-152	C/R	1
dusky shark	*Carcharhinus obscurus*	Reef	0-400	C/R	1, 5
sandbar shark	*Carcharhinus plumbeus*	Reef	?-1800	C/R	1, 5
night shark	*Carcharhinus signatus*	Benthopelagic	0-600	C/R	1
tiger shark	*Galeocerdo cuvier*	Reef	0-350	C/R	1
lemon shark	*Negaprion brevirostris*	Reef	0-92	C/R	1, 5
Atlantic sharpnose shark	*Rhizoprionodon terraenovae*	Demersal	10-280	C/R	1, 5
Centropomidae					
common snook	*Centropomus undecimalis*	Reef	?-22	C	5
Chaenopsidae					
roughhead blenny	*Acanthemblemaria aspera*	Reef	6-18	C	2
spinyhead blenny	*Acanthemblemaria spinosa*	Reef	?-12	C	2
sailfin blenny	*Emblemaria pandionis*	Reef	1-12	C	2
Chaetodontidae					
spotfin butterflyfish	*Chaetodon ocellatus*	Reef	0-30	C	2, 5
reef butterflyfish	*Chaetodon sedentarius*	Reef	5-92	C/R	2, 5
Clupeidae					
blueback herring	*Alosa aestivalis*	Pelagic	5-?	C/R	6
Gulf menhaden	*Brevoortia patronus*	Pelagic	0-50	C/R	5
yellowfin menhaden	*Brevoortia smithi*	Pelagic	0-50	C/R	5

Table A-1 (cont'd)

Fish Species That May Occur in the Site A Range Site and/or the Cable Corridor

Common Name	Scientific Name	Vertical Habitat Category	Depth (m)	Cable and/or Range Overlap	Source
Atlantic menhaden	*Brevoortia tyrannus*	Pelagic	0-50	C/R	3, 4, 5
Atlantic red herring	*Etrumeus teres*	Pelagic	0-150	C/R	3, 4
scaled sardine	*Harengula jaguana*	Reef	?-22	C	5
Atlantic thread herring	*Opisthonema oglinum*	Reef	5-?	C	3, 5
round sardinella	*Sardinella aurita*	Reef	0-350	C/R	4, 5
Congridae					
bandtooth conger	*Ariosoma balearicum*	Reef	1-732	C/R	4
conger eel	*Conger oceanicus*	Demersal	1-477	C/R	5
Coryphaenidae					
pompano dolphinfish	*Coryphaena equiselis*	Pelagic	0-?	C/R	1
dolphinfish	*Coryphaena hippurus*	Pelagic	0-85	C/R	1, 3, 5
Cynoglossidae					
spottedfin tonguefish	*Symphurus diomedeanus*	Reef	6-183	C/R	4
largescale tonguefish	*Symphurus minor*	Demersal	18-170	C/R	4
pygmy tonguefish	*Symphurus parvus*	Demersal	20-440	C/R	4
blackcheek tonguefish	*Symphurus plagiusa*	Demersal	0-183	C/R	4
spottail tonguefish	*Symphurus urospilus*	Demersal	5-324	C/R	4
Dactylopteridae					
flying gurnard	*Dactylopterus volitans*	Reef	1-100	C/R	2
Dactyloscopidae					
speckled stargazer	*Dactyloscopus moorei*	Demersal	3-35	C	3, 4
Dasyatidae					
southern stingray	*Dasyatis americana*	Reef	0-53	C/R	2
bluntnose stingray	*Dasyatis say*	Demersal	1-10	C	5
Diodontidae					
striped burrfish	*Chilomycterus schoepfi*	Reef	0-11	C	2, 5
balloonfish	*Diodon holocanthus*	Reef	2-100	C/R	2, 5
porcupinefish	*Diodon hystrix*	Reef	2-50	C/R	2, 5
Echeneididae					
sharksucker	*Echeneis naucrates*	Reef	20-50	C/R	2, 5
remora	*Remora remora*	Reef	0-100	C/R	5
Elopidae					
ladyfish	*Elops saurus*	Reef	?-50	C/R	4, 5
Engraulidae					
broad-striped anchovy	*Anchoa hepsetus*	Pelagic	1-70	C/R	3, 5
striped anchovy	*Anchoa hepsetus*	Pelagic	1-70	C/R	4, 5
big-eye anchovy	*Anchoa lamprotaenia*	Pelagic	0-50	C/R	4,5
bay anchovy	*Anchoa mitchilli*	Reef	1-36	C	5
silver anchovy	*Engraulis eurystole*	Pelagic	?-65	C/R	3, 5

Table A-1 (cont'd)

Fish Species That May Occur in the Site A Range Site and/or the Cable Corridor

Common Name	Scientific Name	Vertical Habitat Category	Depth (m)	Cable and/or Range Overlap	Source
Ephippidae					
spadefish	*Chaetodipterus faber*	Reef	3-35	C	2, 5
Exocoetidae					
ballyhoo	*Hemiramphus brasiliensis*	Reef	0-5	C	4, 5
fourwing flyingfish	*Hirundichthys affinis*	Pelagic	100-?	R	4, 5
Fistulariidae					
bluespotted cornetfish	*Fistularia tabacaria*	Reef	0-200	C/R	2, 5
Gadidae					
Carolina hake	*Urophycis earllii*	Demersal	0-81	C/R	5
spotted codling	*Urophycis regia*	Demersal	0-494	C/R	4
codlings	*Urophycis sp.*		0-1400	C/R	3
Gempylidae					
	Lepidocybium flavobrunneum	Bathypelagic	200-885	R	
Gerreidae					
Irish pompano	*Diapterus auratus*	Demersal		C	5
spotfin mojarra	*Eucinostomus argenteus*	Reef	0-12	C	5
silver jenny	*Eucinostomus gula*	Reef	?-55	C/R	5
bigeye mojarra	*Eucinostomus havana*	Demersal	?-45	C/R	5
slender mojarra	*Eucinostomus jonesi*	Demersal	0-9	C	2, 5
mottled mojarra	*Eucinostomus lefroyi*	Reef	0-6	C	2, 5
striped mojarra	*Eugerres plumieri*	Demersal		C	5
yellowfin mojarra	*Gerres cinereus*	Reef	1-15	C	2, 5
Ginglymostomatidae					
nurse shark	*Ginglymostoma cirratum*	Reef	0-130	C/R	1, 2, 5
Gobiidae					
colon goby	*Coryphopterus dircus*	Reef	3-20	C	2
bridled goby	*Coryphopterus glaucofraenum*	Reef	2-45	C/R	2
masked/glass goby	*Coryphopterus hyalinus/personatus*	Reef	0-52	C/R	2
neon goby	*Elacatinus oceanops*	Reef	1-45	C/R	2
goldspot goby	*Gnatholepis thompsoni*	Reef	0-50	C/R	2
rockcut goby	*Gobiosoma grosvenori*	Reef	1-11	C	2
tiger goby	*Gobiosoma oceanops*	Reef	1-45	C/R	2
code goby	*Gobiosoma robustum*	Reef		C	5
dash goby	*Gobiosoma saepepallens*	Reef	0-40	C/R	2
blue goby	*Ioglossus calliurus*	Reef	5-50	C/R	2, 4
hovering goby	*Ioglossus helenae*	Reef	3-60	C/R	2

Table A-1 (cont'd)

Fish Species That May Occur in the Site A Range Site and/or the Cable Corridor

Common Name	Scientific Name	Vertical Habitat Category	Depth (m)	Cable and/or Range Overlap	Source
seminole goby	*Microgobius carri*	Reef	6-21	C	2
rusty goby	*Quisquilius hipoliti*	Reef	1-130	C/R	2
Gonostomatidae					
bristlemouths	*Cyclothone spp.*		0-4000	C/R	3
Grammistidae					
greater soapfish	*Rypticus saponaceus*	Reef	1-62	C/R	2
Gymnuridae					
smooth butterfly ray	*Gymnura micrura*	Demersal	?-40	C/R	5
Haemulidae					
black margate	*Anisotremus surinamensis*	Reef	0-20	C	2, 5
porkfish	*Anisotremus virginicus*	Reef	2-20	C	2, 5
margate	*Haemulon album*	Reef	20-60	C/R	2, 5
tomtate	*Haemulon aurolineatum*	Reef	0-30	C	2, 4, 5
caesar grunt	*Haemulon carbonarium*	Reef	3-25	C	2
smallmouth grunt	*Haemulon chrysargyreum*	Reef	0-25	C	2
French grunt	*Haemulon flavolineatum*	Reef	0-60	C/R	2, 5
Spanish grunt	*Haemulon macrostomum*	Reef	5-25	C	2
cottonwick	*Haemulon melanurum*	Reef	3-50	C/R	2
sailors choice	*Haemulon parra*	Reef	3-30	C	2, 5
white grunt	*Haemulon plumierii*	Reef	3-40	C/R	1, 2, 5
bluestriped grunt	*Haemulon sciurus*	Reef	0-30	C	2, 5
striped grunt	*Haemulon striatum*	Reef	10-100	C/R	2
pigfish	*Orthopristis chrysoptera*	Demersal	10-?	C/R	5
Holocentridae					
squirrelfish	*Holocentrus adscensionis*	Reef	0-180	C/R	2, 5
blackbar soldierfish	*Myripristis jacobus*	Reef	0-100	C/R	2, 5
Istiophoridae					
sailfish	*Istiophorus platypterus*	Pelagic	0-200	C/R	1, 5
blue marlin	*Makaira nigricans*	Pelagic	0-200	C/R	1
white marlin	*Tetrapturus albidus*	Pelagic	0-150	C/R	1
Kyphosidae					
Bermuda chub	*Kyphosus sectatrix*	Reef	1-30	C	2, 5
Labridae					
Spanish hogfish	*Bodianus rufus*	Reef	1-70	C/R	2, 5
slippery dick	*Halichoeres bivittatus*	Reef	1-15	C	2, 4, 5
yellowcheek wrasse	*Halichoeres cyanocephalus*	Reef	18-91	C/R	2
yellowhead wrasse	*Halichoeres garnoti*	Reef	2-80	C/R	2
clown wrasse	*Halichoeres maculipinna*	Reef	2-24	C	2

Table A-1 (cont'd)

Fish Species That May Occur in the Site A Range Site and/or the Cable Corridor

Common Name	Scientific Name	Vertical Habitat Category	Depth (m)	Cable and/or Range Overlap	Source
blackear wrasse	*Halichoeres poeyi*	Reef	1-15	C	2
puddingwife	*Halichoeres radiatus*	Reef	2-55	C/R	2
hogfish	*Lachnolaimus maximus*	Reef	3-30	C	2, 5
bluehead wrasse	*Thalassoma bifasciatum*	Reef	0-40	C/R	2
rosy razorfish	*Xyrichtys martinicensis*	Reef	2-21	C	2
pearly razorfish	*Xyrichtys novacula*	Reef	1-90	C/R	4
green razorfish	*Xyrichtys splendens*	Reef	3-15	C	2
Labrisomidae					
downy blenny	*Labrisomus kalisherae*	Reef	2-15	C	2
hairy blenny	*Labrisomus nuchipinnis*	Reef	0-10	C	2, 5
rosy blenny	*Malacoctenus macropus*	Reef	0-8	C	2
saddled blenny	*Malacoctenus triangulatus*	Reef	0-40	C/R	2
banded blenny	*Paraclinus fasciatus*	Reef	0-2	C	2
marbled blenny	*Paraclinus marmoratus*	Reef	0-6	C	2
Lamnidae					
shortfin mako shark	*Isurus oxyrinchus*	Reef	0-740	C/R	5
longfin mako shark	*Isurus paucus*	Pelagic	0-200	C/R	1
Lobotidae					
Atlantic tripletail	*Lobotes surinamensis*	Benthopelagic		C/R	1, 2
Lutjanidae					
queen snapper	*Etelis oculatus*	Bathydemersal	100-450	R	5
mutton snapper	*Lutjanus analis*	Reef	25-95	C/R	1, 2, 4, 5
schoolmaster snapper	*Lutjanus apodus*	Reef	2-63	C/R	2, 5
blackfin snapper	*Lutjanus buccanella*	Reef	20-200	C/R	1
red snapper	*Lutjanus campechanus*	Reef	10-190	C/R	1, 5
cubera snapper	*Lutjanus cyanopterus*	Reef	18-55	C/R	5
gray snapper	*Lutjanus griseus*	Reef	5-180	C/R	1, 2, 5
dog snapper	*Lutjanus jocu*	Reef	2-40	C/R	2, 5
mahogany snapper	*Lutjanus mahogoni*	Reef	0-100	C/R	5
lane snapper	*Lutjanus synagris*	Reef	10-400	C/R	2, 5
silk snapper	*Lutjanus vivanus*	Reef	90-242	R	1, 5
yellowtail snapper	*Ocyurus chrysurus*	Reef	0-180	C/R	2, 5
vermilion snapper	*Rhomboplites aurorubens*	Reef	40-300	R	1, 3, 5
Malacanthidae					
blueline tilefish	*Caulolatilus microps*	Demersal	30-236	C/R	1, 5
tilefish	*Lopholatilus chamaeleonticeps*	Demersal	80-540	R	1, 5
sand tilefish	*Malacanthus plumieri*	Reef	10-153	C/R	2, 5

Table A-1 (cont'd)

Fish Species That May Occur in the Site A Range Site and/or the Cable Corridor

Common Name	Scientific Name	Vertical Habitat Category	Depth (m)	Cable and/or Range Overlap	Source
Megalopidae					
tarpon	*Megalops atlanticus*	Reef	0-30	C	2
Mobulidae					
giant manta	*Manta birostris*	Reef	0-24	C	2, 5
Monacanthidae					
orange filefish	*Aluterus schoepfi*	Reef	3-900	C/R	2, 4
scrawled filefish	*Aluterus scriptus*	Reef	3-120	C/R	2
orangespotted filefish	*Cantherhines pullus*	Reef	3-50	C/R	2
planehead filefish	*Monocanthus hispidus*	Reef	?-80	C/R	2
planehead filefish	*Stephanolepis hispida*	Reef	?-80	C/R	3, 4
pygmy filefish	*Stephanolepis setifer*	Reef	?-80	C/R	4
Mugilidae					
black mullet	*Mugil cephalus*	Benthopelagic	0-120	C/R	4, 5
white mullet	*Mugil curema*	Reef	0-9	C	3, 4, 5
Mullidae					
yellow goatfish	*Mulloidichthys martinicus*	Reef	?-49	C/R	2
spotted goatfish	*Pseudupeneus maculatus*	Reef	?-90	C/R	2
Muraenidae					
green moray	*Gymnothorax funebris*	Reef	1-50	C/R	5
spotted moray	*Gymnothorax moringa*	Reef	0-200	C/R	2, 5
purplemouth moray	*Gymnothorax vicinus*	Reef	?-145	C/R	2, 5
goldentail moray	*Muraena miliaris*	Reef	0-60	C/R	2, 5
Myctophidae					
horned lanternfish	*Ceratoscopelus maderensis*	Bathypelagic	51-1082	R	3
Warming's lanternfish	*Ceratoscopelus warmingii*	Bathypelagic	0-2014	C/R	3
lanternfishes	*Diaphus spp.*	Bathypelagic	0-3872	C/R	3
chubby flashlightfish	*Electrona risso*	Bathypelagic	90-820	R	3
lanternfish	*Hygophum hygomii*	Bathypelagic	0-800	C/R	3
Reinhardt's lantern fish	*Hygophum reinhardtii*	Bathypelagic	0-1050	C/R	3
sunbeam lampfish	*Lampadena urophaos*	Pelagic	0-1000	C/R	3
lanternfishes	*Lepidophanes spp.*	Bathypelagic	0-900	C/R	3
metallic lanternfish	*Myctophum affine*	Bathypelagic	0-600	C/R	3
Wisner's lantern fish	*Myctophum selenops*	Bathypelagic	40-450	R	3
Myliobatidae					
spotted eagle ray	*Aetobatus narinari*	Reef	1-80	C/R	2, 5
Odontaspididae					
sand tiger shark	*Odontaspis taurus*	Reef	1-191	C/R	1

Table A-1 (cont'd)

Fish Species That May Occur in the Site A Range Site and/or the Cable Corridor

Common Name	Scientific Name	Vertical Habitat Category	Depth (m)	Cable and/or Range Overlap	Source
Ogcocephalidae					
pancake batfish	*Halieutichthys aculeatus*	Reef	45-820	R	4
shortnose batfish	*Ogcocephalus nasutus*	Reef	0-305	C/R	4
Ophichthidae					
sharptail eel	*Myrichthys breviceps*	Reef	0-9	C	2
palespotted eel	*Myrichthys ocellatus*	Reef	2-12	C	4
speckled worm eel	*Myrophis punctatus*	Reef	?-20	C	3
shrimp eel	*Ophichthus gomesii*	Demersal	1-450	C/R	4, 5
Ophidiidae					
bearded brotula	*Brotula barbata*	Reef	?-650	C/R	5
longnose/band cusk-eel	*Ophidion antipholus/holbrooki*	Benthopelagic/Reef	0-75	C/R	3
crested cusk-eel	*Ophidion josephi*	Demersal		C/R	3
striped cusk-eel	*Ophidion marginatum*	Demersal		C/R	3
mooneye cusk-eel	*Ophidion selenops*	Reef	12-45	C/R	3, 4
polka-dot cusk-eel	*Otophidium omostigma*	Demersal	10-50	C/R	3, 4
Opistognathidae					
banded jawfish	*Opistognathus macrognathus*	Reef	0-12	C	2
dusky jawfish	*Opistognathus whitehursti*	Reef	1-12	C	2
Ostraciidae					
scrawled cowfish	*Acanthostracion quadricornis*	Reef	0-80	C/R	4
spotted trunkfish	*Lactophrys bicaudalis*	Reef	3-50	C/R	2
honeycomb cowfish	*Lactophrys polygonia*	Reef	3-80	C/R	2
scrawled cowfish	*Lactophrys quadricornis*	Reef	?-80	C/R	2
trunkfish	*Lactophrys trigonus*	Reef	2-50	C/R	2
smooth trunkfish	*Lactrophrys triqueter*	Reef	?-50	C/R	2
Paralepidae					
Atlantic barracudina	*Lestidium atlanticum*	Bathypelagic	50-1000	R	3
Paralichthyidae					
ocellated flounder	*Ancylopsetta quadrocellata*	Demersal	4-110	C/R	4
Gulf Stream flounder	*Citharichthys arctifrons*	Demersal	46-365	R	3
horned whiff	*Citharichthys cornutus*	Bathydemersal	30-400	C/R	3, 5
anglefin whiff	*Citharichthys gymnorhinus*	Demersal	35-200	C/R	3, 5
spotted whiff	*Citharichthys macrops*	Reef	0-90	C/R	4, 5
bay whiff	*Citharichthys spilopterus*	Demersal	0-75	C/R	3, 5

Table A-1 (cont'd)

Fish Species That May Occur in the Site A Range Site and/or the Cable Corridor

Common Name	Scientific Name	Vertical Habitat Category	Depth (m)	Cable and/or Range Overlap	Source
spotfin flounder	*Cyclopsetta fimbriata*	Reef	20-230	C/R	4
flounders	*Engyophrys spp.*	Demersal	35-180	C/R	3
fringed flounder	*Etropus crossotus*	Demersal	0-65	C/R	3
fourspot flounder	*Hippoglossina oblonga*	Demersal		C/R	3
Gulf flounder	*Paralichthys albigutta*	Demersal	19-130	C/R	3, 5
summer flounder	*Paralichthys dentatus*	Demersal	10-?	C	1, 5
southern flounder	*Paralichthys lethostigma*	Demersal	0-40	C/R	3, 5
dusky flounder	*Syacium papillosum*	Reef	10-140	C/R	4
Pempheridae					
glassy sweeper	*Pempheris schomburgki*	Reef	3-30	C	2
Phosichthyidae					
oceanic lightfish	*Vinciguerria nimbaria*	Bathypelagic	20-5000	C/R	3
Polyprionidae					
wreckfish	*Polyprion americanus*	Bathydemersal	40-600	R	1
Pomacanthidae					
blue angelfish	*Holacanthus bermudensis*	Reef	2-92	C/R	2, 5
queen angelfish	*Holacanthus ciliaris*	Reef	1-70	C/R	2, 5
yellowtail damselfish	*Microspathadon chrysurus*	Reef	0-120	C/R	2, 5
gray angelfish	*Pomacanthus arcuatus*	Reef	2-30	C	2, 5
French angelfish	*Pomacanthus paru*	Reef	3-100	C/R	2, 5
longfin damselfish	*Stegastes diencaeus*	Reef	2-45	C/R	2, 5
dusky damselfish	*Stegastes dorsopunicans*	Reef	0-3	C	2, 5
beaugregory	*Stegastes leucostictus*	Reef	?-10	C	2, 5
bicolor damselfish	*Stegastes partitus*	Reef	0-100	C/R	2, 5
threespot damselfish	*Stegastes planifrons*	Reef	1-30	C	2, 5
cocoa damslefish	*Stegastes variabilis*	Reef	0-30	C	2, 5
Pomacentridae					
sergeant major	*Abudefduf saxatilis*	Reef	1-15	C	2, 5
damselfishes	*Chromis spp.*	Reef	3-146	C/R	3, 5
Pomatomidae					
bluefish	*Pomatomus saltatrix*	Pelagic	0-200	C/R	1, 3, 5
Priacanthidae					
bigeye	*Priacanthus arenatus*	Reef	10-200	C/R	4, 5
Rachycentridae					
cobia	*Rachycentron canadum*	Reef	0-1200	C/R	1, 5
Rajidae					
clearnose skate	*Raja eglanteria*	Demersal	0-330	C/R	5
Rhinobatidae					
Atlantic guitarfish	*Rhinobatos lentiginosus*	Reef	0-30	C	1

Table A-1 (cont'd)

Fish Species That May Occur in the Site A Range Site and/or the Cable Corridor

Common Name	Scientific Name	Vertical Habitat Category	Depth (m)	Cable and/or Range Overlap	Source
Scaridae					
bluelip parrotfish	*Cryptotomus roseus*	Reef	?-60	C/R	2, 5
blue parrotfish	*Scarus coeruleus*	Reef	3-25	C	2, 5
striped parrotfish	*Scarus croicensis*	Reef	3-25	C	2, 5
rainbow parrotfish	*Scarus guacamaia*	Reef	3-25	C	2, 5
princess parrotfish	*Scarus taeniopterus*	Reef	2-25	C	2, 5
greenblotch parrotfish	*Sparisoma atomarium*	Reef	20-55	C/R	2, 5
redband parrotfish	*Sparisoma aurofrenatum*	Reef	2-20	C	2, 5
redtail parrotfish	*Sparisoma chrysopterum*	Reef	1-15	C	2, 5
bucktooth parrotfish	*Sparisoma radians*	Reef	1-12	C	2, 5
redfin parrotfishfish	*Sparisoma rubripinne*	Reef	1-15	C	2, 5
stoplight parrotfish	*Sparisoma viride*	Reef	3-50	C/R	2, 5
Sciaenidae					
silver perch	*Bairdiella chrysoura*	Demersal		C	3, 5
sand seatrout	*Cynoscion arenarius*	Demersal		C	5
spotted seatrout	*Cynoscion nebulosus*	Demersal	10-?	C	5
silver seatrout	*Cynoscion nothus*	Demersal		C	3, 4, 5
weakfish	*Cynoscion regalis*	Demersal	10-26	C	3, 4, 5
highhat	*Equetus acuminatus*	Reef	5-18	C	2
banded drum	*Larimus fasciatus*	Demersal	0-60	C/R	3, 4
spot	*Leiostomus xanthurus*	Demersal	0-60	C/R	3, 4, 5
southern kingfish	*Menticirrhus americanus*	Demersal	0-40	C/R	3, 4, 5
northern kingfish	*Menticirrhus saxatilis*	Demersal	10-?	C	5
Atlantic croaker	*Micropogonias undulatus*	Demersal	0-100	C/R	3, 5
reef croaker	*Odontoscion dentex*	Reef	1-30	C	2
black drum	*Pogonias cromis*	Demersal	1-18	C	3, 5
red drum	*Sciaenops ocellatus*	Demersal		C	1, 3, 5
sand drum	*Umbrina coroides*	Demersal		C	5
Scombridae					
wahoo	*Acanthocybium solandri*	Pelagic	0-12	C	1, 5
bullet mackerel	*Auxis rochei*	Pelagic		C	3
little tunny	*Euthynnus alletteratus*	Reef	1-150	C/R	3, 5
skipjack tuna	*Katsuwonus pelamis*	Pelagic	0-260	C/R	5
Atlantic bonito	*Sarda sarda*	Pelagic	80-200	R	5
chub mackerel	*Scomber japonicus*	Pelagic	0-300	C/R	3, 5
cero	*Scomberomorous regalis*	Reef	1-20	C	2, 5
king mackerel	*Scomberomorus cavalla*	Reef	5-140	C/R	1, 3, 5
Spanish mackerel	*Scomberomorus maculatus*	Reef	10-35	C	1, 3, 5

Table A-1 (cont'd)

Fish Species That May Occur in the Site A Range Site and/or the Cable Corridor

Common Name	Scientific Name	Vertical Habitat Category	Depth (m)	Cable and/or Range Overlap	Source
albacore tuna	*Thunnus alalunga*	Pelagic	0-600	C/R	5
yellowfin tuna	*Thunnus albacares*	Pelagic	1-250	C/R	5
blackfin tuna	*Thunnus atlanticus*	Pelagic	50-?	C/R	5
bigeye tuna	*Thunnus obesus*	Pelagic	0-250	C/R	5
bluefin tuna	*Thunnus thynnus*	Pelagic	0-9850	C/R	1, 5
Scorpaenidae					
hunchback scorpionfish	*Scorpaena dispar*	Reef	36-118	C/R	4, 5
spotted scorpionfish	*Scorpaena plumieri*	Reef	1-60	C/R	2, 4, 5
Serranidae					
bank sea bass	*Centropristis ocyurus*	Demersal	18-76	C/R	4, 5
black sea bass	*Centropristis striata*	Reef	2-37	C/R	4, 5
coney	*Cephalopholis fulva*	Reef	2-150	C/R	5
rock sea bass	*Centropristis philadelphica*	Reef		C/R	5
sand perch	*Diplectum formosum*	Reef	1-80	C/R	2, 4, 5
rock hind	*Epinephelus adscensionis*	Demersal	1-120	C/R	2, 5
graysby	*Cephalopholis cruentatus*	Reef	0-170	C/R	2, 5
speckled hind	*Epinephelus drummondhayi*	Demersal	25-183	C/R	1, 5
yellowedge grouper	*Epinephelus flavolimbatus*	Demersal	64-275	R	1, 5
red hind	*Epinephelus guttatus*	Reef	2-100	C/R	5
goliath grouper	*Epinephelus itajara*	Reef	?-100	C/R	1
red grouper	*Epinephelus morio*	Reef	5-330	C/R	2, 5
Warsaw grouper	*Epinephelus nigritus*	Demersal	55-525	R	1, 5
snowy grouper	*Epinephelus niveatus*	Demersal	30-525	C/R	1, 5
Nassau grouper	*Epinephelus striatus*	Reef	1-90	C/R	5, 6
red barbier	*Hemanthias vivanus*	Benthopelagic	45-610	R	3
barred hamlet	*Hypoplectrus puella*	Reef	3-23	C	2
butter hamlet	*Hypoplectrus unicolor*	Reef	3-15	C	2
black grouper	*Mycteroperca bonaci*	Reef	6-33	C	5
yellowmouth grouper	*Mycteroperca interstitialis*	Reef	2-150	C/R	5
gag	*Mycteroperca microlepis*	Reef	40-152	R	5
scamp	*Mycteroperca phenax*	Reef	30-100	C/R	1, 2, 5
pygmy sea bass	*Serraniculus pumilio*	Reef	0-45	C/R	3, 4
lantern bass	*Serranus baldwini*	Reef	1-80	C/R	2
tattler	*Serranus phoebe*	Reef	27-400	C/R	4
harlequin bass	*Serranus tigrinus*	Reef	0-40	C/R	2
Soleidae					
naked sole	*Gymnachirus melas*	Demersal	0-73	C/R	4
hogchoker	*Trinectes maculatus*	Reef	0-75	C/R	3

Table A-1 (cont'd)

Fish Species That May Occur in the Site A Range Site and/or the Cable Corridor

Common Name	Scientific Name	Vertical Habitat Category	Depth (m)	Cable and/or Range Overlap	Source
Sparidae					
sheepshead	*Archosargus probatocephalus*	Reef	1-12	C	5
sea bream	*Archosargus rhomboidalis*	Reef		C	2, 5
grass porgy	*Calamus arctifrons*	Demersal	0-22	C	5
jolthead porgy	*Calamus bajonado*	Reef	3-200	C/R	2, 5
saucereye porgy	*Calamus calamus*	Reef	1-75	C/R	2, 5
whitebone porgy	*Calamus leucosteus*	Demersal	10-100	C/R	5
sheepshead porgy	*Calamus penna*	Reef	3-87	C/R	2
littlehead porgy	*Calamus proridens*	Reef		C/R	5
knobbed porgy	*Calamus nodosus*	Reef	7-90	C/R	5
silver porgy	*Diplodus argenteus*	Reef	0-24	C	2, 5
spottail pinfish	*Diplodus holbrooki*	Demersal	?-28	C	2, 5
pinfish	*Lagodon rhomboides*	Demersal	1-20	C	3, 4, 5
red porgy	*Pagrus pagrus*	Benthopelagic	0-250	C/R	1
porgies	*Stenotomus sp.*	Demersal	5-185	C/R	4
Sphyraenidae					
great barracuda	*Sphyraena barracuda*	Reef	1-100	C/R	2, 5
Sphyrnidae					
bonnethead shark	*Sphyrna corona*	Demersal		C/R	1
scalloped hammerhead shark	*Sphyrna lewini*	Reef	0-512	C/R	1, 5
Squalidae					
spiny dogfish	*Squalus acanthias*	Benthopelagic	0-1460	C/R	1
Stromateidae					
driftfishes	*Ariomma sp.*	Various	20-600	C/R	3
gulf butterfish	*Peprilus burti*	Benthopelagic		C	5
butterfish	*Peprilus triacanthus*	Benthopelagic	15-?	C/R	4, 5
Syngnathidae					
whitenose pipefish	*Cosmocampus albirostris*	Reef	0-50	C/R	2, 5
shortfin pipefish	*Cosmocampus elucens*	Reef	?-345	C/R	2, 5
lined seahorse	*Hippocampus erectus*	Reef	1-73	C/R	4, 5
northern pipefish	*Syngnathus fuscus*	Demersal	5-366	C/R	3, 5
chain pipefish	*Syngnathus louisianae*	Reef		C/R	3, 5
Gulf pipefish	*Syngnathus scovelli*	Demersal	?-6	C	4, 5
bull pipefish	*Syngnathus springeri*	Reef	18-127	C/R	4, 5
Synodontidae					
inshore lizardfish	*Synodus foetens*	Reef	0-200	C/R	2, 4, 5
sand diver	*Synodus intermedius*	Reef	3-320	C/R	2, 5

Table A-1 (cont'd)

Fish Species That May Occur in the Site A Range Site and/or the Cable Corridor

Common Name	Scientific Name	Vertical Habitat Category	Depth (m)	Cable and/or Range Overlap	Source
offshore lizardfish	*Synodus poeyi*	Reef	27-320	C/R	4, 5
bluntnose lizardfish	*Trachinocephalus myops*	Reef	1-396	C/R	4, 5
Tetraodontidae					
sharpnose puffer	*Canthigaster rostrata*	Reef	1-40	C/R	2, 5
oceanic puffer	*Lagocephalus lagocephalus lagocephalus*	Reef	10-476	C/R	5
southern puffer	*Sphoeroides nephelus*	Reef	0-11	C	5
bandtail puffer	*Sphoeroides spengleri*	Reef	2-70	C/R	2, 5
checkered puffer	*Sphoeroides testudineus*	Reef	?-48	C/R	5
Trachipteridae					
Ribbonfishes		Bathypelagic	?-90	C/R	5
Triakidae					
smooth dogfish	*Mustelus canis*	Demersal	?-800	C/R	5
Trichiuridae					
Atlantic cuttlassfish	*Trichiurus lepturus*	Benthopelagic	0-400	C/R	5
Triglidae					
shortfin searobin	*Bellator brachychir*	Demersal	35-200	C/R	4, 5
horned searobin	*Bellator militaris*	Demersal	40-110	R	4, 5
common searobin	*Prionotus carolinus*	Demersal	15-170	C/R	4, 5
bandtail searobin	*Prionotus ophryas*	Reef	1-171	C/R	4, 5
leopard searobin	*Prionotus scitulus*	Demersal	?-45	C/R	2, 4 , 5
bighead searobin	*Prionotus tribulus*	Demersal		C	5
Uranoscopidae					
southern stargazer	*Astroscopus y-graecum*	Reef	2-100	C/R	5
lancer stargazer	*Kathetostoma albigutta*	Demersal	40-385	R	4
Urolophidae					
yellow stingray	*Urobatis jamaicensis*	Reef	1-25	C	2, 5
Xiphiidae					
swordfish	*Xiphias gladius*	Pelagic	0-800	C/R	1, 5

Source: (1) Department of the Navy 2007; (2) Baron et al. 2004; (3) Marancik et al. 2005; (4) Walsh et al. 2006; (5) NMFS 2007; (6)VIMSc 2007.

Available depth information and Cable and/or Range Overlap (C/R [cable and range], C [cable only], R [range only]) assignment based on Bigelow and Schroeder 1953, Bohlke and Chaplin 1993, Humann and DeLoach 2002, and www.fishbase.org (accessed May 2007).

Table A-2

Fish Species That May Occur in the Site B Range Site and/or the Cable Corridor

Common Name	Scientific Name	Vertical Habitat Category	Depth (m)	Cable and/or Range Overlap	Source
Acipenseridae					
shortnose sturgeon	*Acipenser brevirostrum*	Demersal	-	C	5
Atlantic sturgeon	*Acipenser oxyrinchus oxyrinchus*	Demersal	0-46	C	6
Anguillidae					
American eel	*Anguilla rostrata*	Demersal	0-464	C/R	2
Antennariidae					
ocellated frogfish	*Antennarius ocellatus*	Reef	1-500	C/R	6
Apogonidae					
twospot cardinalfish	*Apogon pseudomaculatus*	Reef	1-100	C/R	4, 6
short bigeye	*Pristigenys alta*	Reef	5-200	C/R	6
Ariidae					
hardhead catfish	*Ariopsis felis*	Reef		C/R	2
Balistidae					
gray triggerfish	*Balistes capriscus*	Reef	0-100	C/R	7, 2, 6
queen triggerfish	*Balistes vetula*	Reef	2-275	C/R	2, 6
Batrachoididae					
leopard toadfish	*Opsanus pardus*	Reef		R	6
oyster toadfish	*Opsanus tau*	Reef		C	2
Atlantic midshipman	*Porichthys plectrodon*	Demersal	?-100	C/R	4
Belonidae					
Atlantic needlefish	*Strongylura marina*	Reef	1-?	C	2
Bothidae					
eyed flounder	*Bothus ocellatus*	Reef	1-110	C/R	6
Carangidae					
African pompano	*Alectis ciliaris*	Reef	60-100	R	6
threadfin	*Alectis ciliaris*	Reef	60-100	R	2
blue runner	*Caranx crysos*	Reef	0-100	C/R	2
crevalle jack	*Caranx hippos*	Reef	1-350	C/R	3
bar jack	*Caranx ruber*	Reef	0-35	C	6
round scad	*Decapterus punctatus*	Reef	0-100	C/R	6
leatherjacket	*Oligoplites saurus*	Reef		C	2
greater amberjack	*Seriola dumerili*	Reef	1-360	C/R	7, 2, 3, 6
almaco jack	*Seriola rivoliana*	Reef	5-160	C/R	7, 2, 3, 6
banded rudderfish	*Seriola zonata*	Benthopelagic		C/R	2, 3
Florida pompano	*Trachinotus carolinus*	Benthopelagic	?-70	C/R	2, 3
palometa	*Trachinotus goodei*	Reef	0-12	C	2
Carcharhinidae					
spinner shark	*Carcharhinus brevipinna*	Reef	0-100	C/R	2, 3
silky shark	*Carcharhinus falciformis*	Reef	0-4000	C/R	3, 6
bull shark	*Carcharhinus leucas*	Reef	1-152	C/R	2, 3
blacktip shark	*Carcharhinus limbatus*	Reef	0-30	C	2, 3
dusky shark	*Carcharhinus obscurus*	Reef	0-400	C/R	2, 3
sandbar shark	*Carcharhinus plumbeus*	Reef	?-1800	C/R	2, 3
night shark	*Carcharhinus signatus*	Benthopelagic	0-600	C/R	1

Table A-2 (cont'd)

Fish Species That May Occur in the Site B Range Site and/or the Cable Corridor

Common Name	Scientific Name	Vertical Habitat Category	Depth (m)	Cable and/or Range Overlap	Source
tiger shark	*Galeocerdo cuvier*	Reef	0-350	C/R	2, 3
lemon shark	*Negaprion brevirostris*	Reef	0-92	C/R	2
Atlantic sharpnose shark	*Rhizoprionodon terraenovae*	Demersal	10-280	C/R	2, 3
Chaetodontidae					
spotfin butterflyfish	*Chaetodon ocellatus*	Reef	0-30	C	6
reef butterflyfish	*Chaetodon sedentarius*	Reef	5-92	C/R	6
Clupeidae					
American shad	*Alosa sapidissima*	Pelagic	0-250	C/R	2
Atlantic menhaden	*Brevoortia tyrannus*	Pelagic	0-50	C/R	2
Atlantic thread herring	*Opisthonema oglinum*	Reef	5-?	C	2
Congridae					
conger eel	*Conger oceanicus*	Demersal	1-477	C/R	6
margintail conger	*Paraconger caudilimbatus*	Reef	?-75	C/R	6
Coryphaenidae					
dolphinfish	*Coryphaena hippurus*	Pelagic	0-85	C/R	2, 3
Dasyatidae					
southern stingray	*Dasyatis americana*	Reef	0-53	C/R	2, 6
Atlantic stingray	*Dasyatis sabina*	Demersal	?-25	C	2
Echeneididae					
remora	*Remora remora*	Reef	0-100	C/R	2
Elopidae					
ladyfish	*Elops saurus*	Reef	?-50	C/R	2
ladyfish	*Elops saurus*	Reef	?-50	C/R	3
Engraulidae					
anchovies	*Anchoa sp.*	Pelagic/Reef	0-70	C/R	6
Ephippidae					
Atlantic spadefish	*Chaetodipterus faber*	Reef	3-35	C	2, 3, 6
Fistulariidae					
red cornetfish	*Fistularia petimba*	Reef	10-200	C/R	6
Gadidae					
Carolina hake	*Urophycis earllii*	Demersal	0-81	C/R	6
southern hake	*Urophycis floridana*	Demersal	0-400	C/R	5
spotted codling	*Urophycis regia*	Demersal	0-494	C/R	4
white hake	*Urophycis tenuis*	Demersal	0-980	C/R	2
Haemulidae					
margate	*Haemulon album*	Reef	20-60	C/R	2
tomtate	*Haemulon aurolineatum*	Reef	0-30	C	7, 2, 4, 6
cottonwick	*Haemulon melanurum*	Reef	3-50	C/R	6
white grunt	*Haemulon plumierii*	Reef	3-40	C	7, 6
pigfish	*Orthopristis chrysoptera*	Demersal	10-?	C/R	7, 2 4
Holocentridae					
blue angelfish	*Holacanthus bermudensis*	Reef	2-92	C/R	6
squirrelfish	*Holocentrus adscensionis*	Reef	0-180	C/R	2, 6

Table A-2 (cont'd)

Fish Species That May Occur in the Site B Range Site and/or the Cable Corridor

Common Name	Scientific Name	Vertical Habitat Category	Depth (m)	Cable and/or Range Overlap	Source
longspine squirrelfish	*Holocentrus rufus*	Reef	0-32	C	6
Istiophoridae					
sailfish	*Istiophorus platypterus*	Pelagic	0-200	C/R	3
blue marlin	*Makaira nigricans*	Pelagic	0-200	C/R	3
white marlin	*Tetrapturus albidus*	Pelagic	0-150	C/R	3
longbill spearfish	*Tetrapturus pfluegeri*	Pelagic	0-200	C/R	3
Kyphosidae					
Bermuda chub	*Kyphosus sectatrix*	Reef	1-30	C	6
Labridae					
spotfin hogfish	*Bodianus pulchellus*	Reef	15-100	C/R	6
Spanish hogfish	*Bodianus rufus*	Reef	1-70	C/R	6
slippery dick	*Halichoeres bivittatus*	Reef	1-15	C	6
yellowhead wrasse	*Halichoeres garnoti*	Reef	2-80	C/R	6
hogfish	*Lachnolaimus maximus*	Reef	3-30	C	6
tautog	*Tautoga onitis*	Reef	1-75	C/R	6
pearly razorfish	*Xyrichtys novacula*	Reef	1-90	C/R	6
green razorfish	*Xyrichtys splendens*	Reef	3-15	C	6
Lutjanidae					
blackfin snapper	*Lutjanus buccanella*	Reef	20-200	C/R	6
red snapper	*Lutjanus campechanus*	Reef	10-190	C/R	7, 2, 3, 4, 6
cubera snapper	*Lutjanus cyanopterus*	Reef	18-55	C/R	6
gray snapper	*Lutjanus griseus*	Reef	5-180	C/R	2
lane snapper	*Lutjanus synagris*	Reef	10-400	C/R	6
silk snapper	*Lutjanus vivanus*	Reef	90-242	R	7, 2, 6
yellowtail snapper	*Ocyurus chrysurus*	Reef	0-180	C/R	6
vermilion snapper	*Rhomboplites aurorubens*	Reef	40-300	R	7, 2, 3, 4, 6
Malacanthidae					
goldface tilefish	*Caulolatilus chrysops*	Demersal	76-244	R	6
blueline tilefish	*Caulolatilus microps*	Demersal	30-236	C/R	7, 5, 6
tilefish	*Lopholatilus chamaeleonticeps*	Demersal	80-540	R	2, 5
sand tilefish	*Malacanthus plumieri*	Reef	10-153	C/R	7, 6
Monacanthidae					
orange filefish	*Aluterus schoepfi*	Reef	3-900	C/R	4, 6
fringed filefish	*Monacanthus ciliatus*	Reef	?-50	C/R	6
planehead filefish	*Stephanolepis hispida*	Reef	?-80	C/R	4, 6
Moronidae					
striped bass	*Morone saxatilis*	Demersal	30-?	C	2
Mugilidae					
striped mullet	*Mugil cephalus*	Benthopelagic	0-120	C/R	2
Mullidae					
red goatfish	*Mullus auratus*	Demersal	9-91	C/R	4

Table A-2 (cont'd)

Fish Species That May Occur in the Site B Range Site and/or the Cable Corridor

Common Name	Scientific Name	Vertical Habitat Category	Depth (m)	Cable and/or Range Overlap	Source
spotted goatfish	*Pseudupeneus maculatus*	Reef	?-90	C/R	6
Muraenidae					
green moray	*Gymnothorax funebris*	Reef	1-50	C/R	2
blackedge moray	*Gymnothorax nigromarginatus*	Reef	10-19	C	6
goldentail moray	*Muraena miliaris*	Reef	0-60	C/R	2
reticulate moray	*Muraena retifera*	Demersal	15-76	C/R	6
morays	*Muranidae*	Reef	0-200	C/R	7
Odontaspididae					
sand tiger shark	*Odontaspis taurus*	Reef	1-191	C/R	2
Ogcocephalidae					
pancake batfish	*Halieutichthys aculeatus*	Reef	45-820	R	6
Ogcocephalidae					
batfish	*Ogcocephalus sp.*	Demersal/Reef	28-820	C/R	6
Ophichthidae					
goldspotted eel	*Myrichthys ocellatus*	Reef	2-12	C	6
Ophidiidae					
bank cusk-eel	*Ophidion holbrookii*	Reef	0-75	C/R	4
striped cusk-eel	*Ophidion marginatum*	Demersal		C/R	6
Ostraciidae					
scrawled cowfish	*Lactophrys quadricornis*	Reef	?-80	C/R	4
Paralichthyidae					
summer flounder	*Paralichthys dentatus*	Demersal	10-?	C	2, 6
southern flounder	*Paralichthys lethostigma*	Demersal	0-40	C	2, 3
dusky flounder	*Syacium papillosum*	Reef	10-140	C/R	7, 4, 6
Pomacanthidae					
angelfishes	*Holacanthus* sp.	Reef	1-92	C/R	2
sergeant major	*Abudefduf saxatilis*	Reef	1-15	C	6
yellowtail reeffish	*Chromis enchrysura*	Reef	5-146	C/R	6
yellowtail damselfish	*Microspathodon chrysurus*	Reef	0-120	C/R	6
bicolor damselfish	*Pomacentrus partitus*	Reef	0-100	C/R	6
dusky damselfish	*Stegastes fuscus*	Reef	1-12	C	6
beaugregory	*Stegastes leucostictus*	Reef	?-10	C	6
Pomatomidae					
bluefish	*Pomatomus saltatrix*	Pelagic	0-200	C/R	2, 3
Priacanthidae					
glasseye snapper	*Heteropriacanthus cruentatus*	Reef	3-300	C/R	6
bigeye	*Priacanthus arenatus*	Reef	10-200	C/R	4
Rachycentridae					
cobia	*Rachycentron canadum*	Reef	0-1200	C/R	2, 3, 6
Rajidae					
clearnose skate	*Raja eglanteria*	Demersal	0-330	C/R	2
skate genus	*Raja* sp.	Demersal	0-750	C/R	2, 6

Table A-2 (cont'd)

Fish Species That May Occur in the Site B Range Site and/or the Cable Corridor

Common Name	Scientific Name	Vertical Habitat Category	Depth (m)	Cable and/or Range Overlap	Source
Rhinobatidae					
Atlantic guitarfish	*Rhinobatos lentiginosus*	Reef	0-30	C	6
Sciaenidae					
silver perch	*Bairdiella chrysoura*	Demersal		C	2
spotted seatrout	*Cynoscion nebulosus*	Demersal	10-?	C	2, 3
weakfish	*Cynoscion regalis*	Demersal	10-26	C	2
highhat	*Equetus acuminatus*	Reef	5-18	C	6
jackknife fish	*Equetus lanceolatus*	Reef	10-60	C/R	4, 6
spot	*Leiostomus xanthurus*	Demersal	0-60	C/R	2
southern kingfish	*Menticirrhus americanus*	Demersal	0-40	C	2, 3
Atlantic croaker	*Micropogonias undulatus*	Demersal	0-100	C/R	2
cubbyu	*Pareques umbrosus*	Reef	5-91	C/R	2,4, 6
black drum	*Pogonias cromis*	Demersal	1-18	C	2, 3
red drum	*Sciaenops ocellatus*	Demersal	10-?	C	2, 3
Scombridae					
wahoo	*Acanthocybium solandri*	Pelagic	0-12	C	2, 3
little tunny	*Euthynnus alletteratus*	Reef	1-150	C/R	2, 3
Atlantic bonito	*Sarda sarda*	Pelagic	80-200	R	3
cero	*Scomberomorous regalis*	Reef	1-20	C	2
king mackerel	*Scomberomorus cavalla*	Reef	5-140	C/R	2, 3
Spanish mackerel	*Scomberomorus maculatus*	Reef	10-35	C	2, 3
yellowfin tuna	*Thunnus albacares*	Pelagic	1-250	C/R	2, 3
blackfin tuna	*Thunnus atlanticus*	Pelagic	50-?	R	2, 3
Scorpaenidae					
blackbelly rosefish	*Helicolenus dactylopterus*	Bathydemersal	50-1100	R	2, 5
spinycheek scorpionfish	*Neomerinthe hemingwayi*	Demersal	45-230	R	2, 6
longspine scorpionfish	*Pontinus longispinis*	Demersal	75-440	R	2, 5
spinythroat scorpionfish	*Pontinus nematophthalmus*	Demersal	82-410	R	2, 6
barbfish	*Scorpaena brasiliensis*	Reef	1-100	C/R	2, 6
smoothhead scorpionfish	*Scorpaena calcarata*	Reef	?-90	C/R	2, 4
spotted scorpionfish	*Scorpaena plumieri*	Reef	1-60	C/R	2, 6
Serranidae					
yellowfin bass	*Anthias nicholsi*	Benthopelagic		C/R	5
bank sea bass	*Centropristis ocyurus*	Demersal	18-76	C/R	7, 2, 4, 6
rock sea bass	*Centropristis philadelphica*	Reef		C/R	2
black sea bass	*Centropristis striata*	Reef	2-37	C	7, 2, 4, 6
graysby	*Cephalopholis cruentata*	Reef	0-170	C/R	6
coney	*Cephalopholis fulva*	Reef	2-150	C/R	3, 6
marbled grouper	*Dermatolepis inermis*	Reef	3-213	C/R	6
dwarf sand perch	*Diplectrum bivittatum*	Reef	?-100	C/R	2

Table A-2 (cont'd)

Fish Species That May Occur in the Site B Range Site and/or the Cable Corridor

Common Name	Scientific Name	Vertical Habitat Category	Depth (m)	Cable and/or Range Overlap	Source
sand perch	*Diplectum formosum*	Reef	1-80	C/R	7, 2, 4, 6
rock hind	*Epinephelus adscensionis*	Demersal	1-120	C/R	7, 2, 3, 6
graysby	*Epinephelus cruentatus*	Reef	0-170	C/R	2
speckled hind	*Epinephelus drummondhayi*	Demersal	25-183	C/R	7, 2, 3, 6
yellowedge grouper	*Epinephelus flavolimbatus*	Demersal	64-275	R	7, 3, 6
red hind	*Epinephelus guttatus*	Reef	2-100	C/R	7, 2, 3, 6
red grouper	*Epinephelus morio*	Reef	5-330	C/R	7, 2, 6
misty grouper	*Epinephelus mystacinus*	Bathydemersal	30-400	C/R	3, 6
Warsaw grouper	*Epinephelus nigritus*	Demersal	55-525	R	7, 3, 6
snowy grouper	*Epinephelus niveatus*	Demersal	30-525	C/R	7, 3, 5, 6
Nassau grouper	*Epinephelus striatus*	Reef	1-90	C/R	5, 6
red barbier	*Hemanthias vivanus*	Benthopelagic	45-610	R	5
gag	*Mycteroperca microlepis*	Reef	40-152	R	7, 2, 6
scamp	*Mycteroperca phenax*	Reef	30-100	C/R	7, 2, 6
Atlantic creolefish	*Paranthias furcifer*	Reef	8-100	C/R	6
roughtongue bass	*Pronotogrammus martinicensis*	Demersal	65-230	R	6
greater soapfish	*Rypticus saponaceus*	Reef	1-62	C/R	6
tattler	*Serranus phoebe*	Reef	27-400	C/R	7, 4, 6
Sparidae					
sheepshead	*Archosargus probatocephalus*	Reef	1-12	C	2, 3
sea bream	*Archosargus rhomboidalis*	Reef		C	2
jolthead porgy	*Calamus bajonado*	Reef	3-200	C/R	2
whitebone porgy	*Calamus leucosteus*	Demersal	10-100	C/R	7, 4, 6
knobbed porgy	*Calamus nodosus*	Reef	7-90	C/R	7, 2, 6
sheepshead porgy	*Calamus penna*	Reef	3-87	C/R	7
spottail pinfish	*Diplodus holbrooki*	Demersal	?-28	C	7, 2, 6
pinfish	*Lagodon rhomboides*	Demersal	1-20	C	2, 4
red porgy	*Pagrus pagrus*	Benthopelagic	0-250	C/R	7, 2, 4, 6
longspine porgy	*Stenotomus caprinus*	Demersal	5-185	C/R	7, 2, 6
scup	*Stenotomus chrysops*	Demersal	0-15	C	2, 4
Sphyraenidae					
great barracuda	*Sphyraena barracuda*	Reef	1-100	C/R	2, 6
barracudas	*Sphyraena* sp.	Reef	1-100	C/R	2
Sphyrnidae					
bonnethead shark	*Sphyrna corona*	Demersal		C/R	2, 3
scalloped hammerhead shark	*Sphyrna lewini*	Reef	0-512	C/R	2, 3, 6
Squalidae					
spiny dogfish	*Squalus acanthias*	Benthopelagic	0-1460	C/R	2, 3
Stromateidae					
butterfish	*Peprilus triacanthus*	Benthopelagic	15-?	C/R	2
Syngnathidae					
lined seahorse	*Hippocampus erectus*	Reef	1-73	C/R	6
pipefish	*Syngnathus* sp.	Demersal	5-366	C/R	6

Table A-2 (cont'd)

Fish Species That May Occur in the Site B Range Site and/or the Cable Corridor

Common Name	Scientific Name	Vertical Habitat Category	Depth (m)	Cable and/or Range Overlap	Source
Synodontidae					
inshore lizardfish	*Synodus foetens*	Reef	0-200	C/R	2, 4, 6
offshore lizardfish	*Synodus poeyi*	Reef	27-320	C/R	2, 4
red lizardfish	*Synodus synodus*	Reef	1-40	C	2, 6
bluntnose lizardfish	*Trachinocephalus myops*	Reef	1-396	C/R	7, 6
Tetraodontidae					
marbled puffer	*Sphoeroides dorsalis*	Demersal	20-100	C/R	2, 6
northern puffer	*Sphoeroides maculatus*	Demersal	0-10	C	2
bandtail puffer	*Sphoeroides spengleri*	Reef	2-70	C/R	2, 6
Trachipteridae					
Ribbonfishes	*Trachipterus* sp.	Bathypelagic	?-90	C/R	2
Triakidae					
smooth dogfish	*Mustelus canis*	Demersal	?-800	C/R	2
Triglidae					
common searobin	*Prionotus carolinus*	Demersal	15-170	C/R	2, 4, 6
Uranoscopidae					
southern stargazer	*Astroscopus y-graecum*	Reef	2-100	C/R	6
Xiphiidae					
swordfish	*Xiphias gladius*	Pelagic	0-800	C/R	2, 3

Source: (1) Department of the Navy 2007; (2) NMFS 2007; (3) SCDNR 2007; (4) Sedberry et al. 1984; (5) Parker and Mays 1998; (6) Grimes et al. 1982; (7) Chester et al. 1984.

Available depth information and Cable and/or Range Overlap (C/R [cable and range], C [cable only], R [range only]) assignment based on Bigelow and Schroeder 1953, Bohlke and Chaplin 1993, Humann and DeLoach 2002, and www.fishbase.org (accessed September 2007).

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Table A-3

Fish Species That May Occur in the Site C Range Site and/or the Cable Corridor

Common Name	Scientific Name	Vertical Habitat Category	Depth (m)	Cable and/or Range Overlap	Source
Acanthuridae					
ocean surgeon	*Acanthurus bahianus*	Reef	2-40	C	3
doctorfish	*Acanthurus chirurgus*	Reef	2-25	C	2, 3, 4
blue tang	*Acanthurus coeruleus*	Reef	2-40	C	2, 3
Acipenseridae					
shortnose sturgeon	*Acipenser brevirostrum*	Demersal		C	12
Atlantic sturgeon	*Acipenser oxyrinchus oxyrinchus*	Demersal	0-46	C	6
Acropomatidae					
temperate ocean basses	*Synagrops* sp.	Bathydemersal	0-30	C	4
Alopiidae					
bigeye thresher shark	*Alopias superciliosus*	Pelagic	0-500	C/R	1
thresher shark	*Alopias vulpinus*	Pelagic	0-550	C/R	12
Ammodytidae					
American sand lance	*Ammodytes americanus*	Demersal	0-73	C/R	4
Anguillidae					
American eel	*Anguilla rostrata*	Demersal	0-464	C/R	10, 12
Antennariidae					
ocellated frogfish	*Antennarius ocellatus*	Reef	1-150	C/R	12
Apogonidae					
bigtooth cardinalfish	*Apogon affinis*	Reef	20-300	C/R	4
deepwater cardinalfish	*Apogon gouldi*	Demersal	55-262	R	4
twospot cardinalfish	*Apogon pseudomaculatus*	Reef	1-100	C/R	2, 4
Balistidae					
gray triggerfish	*Balistes capriscus*	Reef	0-100	C/R	2, 3, 4, 5, 12
ocean triggerfish	*Canthidermis sufflamen*	Reef	5-60	C/R	5
Batrachoididae					
oyster toadfish	*Opsanus tau*	Reef	1-30	C	2, 12
Belonidae					
Atlantic needlefish	*Strongylura marina*	Reef	1-?	C	12
houndfish	*Tylosurus crocodilus crocodilus*	Reef	0-13	C/R	12
Blenniidae					
seaweed blenny	*Parablennius marmoreus*	Reef	0-10	C	2
molly miller	*Scartella cristata*	Reef	0-10	C	2

Table A-3 (cont'd)

Fish Species That May Occur in the Site C Range Site and/or the Cable Corridor

Common Name	Scientific Name	Vertical Habitat Category	Depth (m)	Cable and/or Range Overlap	Source
Bothidae					
eyed flounder	*Bothus ocellatus*	Reef	1-110	C/R	3, 4
deepwater flounder	*Monolene sessilicauda*	Bathydemersal	150-550	R	4
sash flounder	*Trichopsetta ventralis*	Demersal	30-110	C/R	3
Bregmacerotidae					
antenna codlet	*Bregmaceros atlanticus*	Pelagic		C/R	11
stellate codlet	*Bregmaceros houdei*	Pelagic		C/R	11
Bythitidae					
black brotula	*Stygnobrotula latebricola*	Reef	1-21	C	4
Callionymidae					
spotted dragonet	*Diplogrammus pauciradiatus*	Reef		C	3, 11
spotfin dragonet	*Foetorepus agassizii*	Bathydemersal	91-700	R	4
lancer dragonet	*Paradiplogrammus bairdi*	Reef	1-91	C/R	3
Caproidae					
deepbody boarfish	*Antigonia capros*	Demersal	50-900	R	3, 4
Carangidae					
threadfin	*Alectis ciliaris*	Reef	60-100	R	3
porkfish	*Anisotremus virginicus*	Reef	2-20	C	5
yellow jack	*Carangoides bartholomaei*	Reef	0-50	C/R	4, 5
bar jack	*Carangoides ruber*	Reef	0-35	C	2, 5
blue runner	*Caranx crysos*	Reef	0-100	C/R	5, 12
crevalle jack	*Caranx hippos*	Reef	1-350	C/R	2, 5, 12
black jack	*Caranx lugubris*	Benthopelagic	12-354	C/R	4
mackerel scad	*Decapterus macarellus*	Pelagic	0-200	C/R	2
round scad	*Decapterus punctatus*	Pelagic	0-100	C/R	3, 12
rainbow runner	*Elagatis bipinnulata*	Reef	0-150	C/R	12
leatherjacket	*Oligoplites saurus*	Reef		C	12
bigeye scad	*Selar crumenophthalmus*	Reef	0-170	C/R	3
lookdown	*Selene vomer*	Demersal	1-53	C/R	12
greater amberjack	*Seriola dumerili*	Reef	1-360	C/R	1, 2, 4, 5, 6, 12
lesser amberjack	*Seriola fasciata*	Benthopelagic	55-130	R	5, 12
almaco jack	*Seriola rivoliana*	Reef	5-160	C/R	4, 5, 12
banded rudderfish	*Seriola zonata*	Benthopelagic		C	5, 12
Florida pompano	*Trachinotus carolinus*	Benthopelagic	?-70	C/R	12

Table A-3 (cont'd)

Fish Species That May Occur in the Site C Range Site and/or the Cable Corridor

Common Name	Scientific Name	Vertical Habitat Category	Depth (m)	Cable and/or Range Overlap	Source
Carcharhinidae					
bignose shark	*Carcharhinus altimus*	Reef	25-500	C/R	1
spinner shark	*Carcharhinus brevipinna*	Reef	0-100	C/R	1
silky shark	*Carcharhinus falciformis*	Reef	0-4000	C/R	1
finetooth shark	*Carcharhinus isodon*	Demersal	0-10	C	1
blacktip shark	*Carcharhinus limbatus*	Reef	0-30	C	1, 6, 12
oceanic whitetip shark	*Carcharhinus longimanus*	Reef	0-152	C/R	1
dusky shark	*Carcharhinus obscurus*	Reef	0-400	C/R	1
sandbar shark	*Carcharhinus plumbeus*	Reef	?-1800	C/R	1, 12
night shark	*Carcharhinus signatus*	Benthopelagic	0-600	C/R	1
tiger shark	*Galeocerdo cuvier*	Reef	0-350	C/R	1, 6, 12
Atlantic sharpnose shark	*Rhizoprionodon terraenovae*	Demersal	10-280	C/R	1, 12
Centrolophidae					
barrelfish	*Hyperoglyphe perciformis*	Pelagic		R	4
Chaetodontidae					
longsnout butterflyfish	*Chaetodon aculeatus*	Reef	1-90	C/R	2
spotfin butterflyfish	*Chaetodon ocellatus*	Reef	0-30	C	2, 3, 4
reef butterflyfish	*Chaetodon sedentarius*	Reef	5-92	C/R	2, 4
longsnout butterflyfish	*Prognathodes aculeatus*	Reef	1-90	C/R	4
bank butterflyfish	*Prognathodes aya*	Reef	20-170	C/R	4
Guyana butterflyfish	*Prognathodes guyanensis*	Reef	60-230	R	4
Chlopsidae					
bicolor eel	*Chlopsis bicolor*	Demersal	80-365	R	10
mottled false moray	*Chlopsis dentatus*	Demersal	64-355	R	10
collared eel	*Kaupichthys nuchalis*	Reef	1-77	C/R	10
Atlantic thread herring	*Opisthonema oglinum*	Reef	5-?	C	12
Chlorophthalmidae					
shortnose greeneye	*Chlorophthalmus agassizi*	Bathydemersal	50-1000	R	4

Table A-3 (cont'd)

Fish Species That May Occur in the Site C Range Site and/or the Cable Corridor

Common Name	Scientific Name	Vertical Habitat Category	Depth (m)	Cable and/or Range Overlap	Source
Cirrhitidae					
redspotted hawkfish	*Amblycirrhitus pinos*	Reef	2-46	C/R	11
Clupeidae					
blueback herring	*Alosa aestivalis*	Pelagic	5-?	C/R	8, 12
hickory shad	*Alosa mediocris*	Pelagic		C/R	6, 12
alewife	*Alosa pseudoharengus*	Pelagic	5-145	C/R	8, 12
American shad	*Alosa sapidissima*	Pelagic	0-250	C/R	12
Atlantic menhaden	*Brevoortia tyrannus*	Pelagic	0-50	C/R	6, 12
American gizzard shad	*Dorosoma cepedianum*	Pelagic	?-33	C	12
threadfin shad	*Dorosoma petenense*	Pelagic	0-15	C	12
Atlantic red herring	*Etrumeus teres*	Pelagic	0-150	C/R	9, 12
Congridae					
bandtooth conger	*Ariosoma balearicum*	Reef	1-732	C/R	4, 10
dubious conger	*Bathycongrus dubius*	Bathydemersal	128-886	R	10
Antillean conger	*Conger esculentus*	Reef	120-400	R	10
conger eel	*Conger oceanicus*	Demersal	1-477	C/R	2, 4, 10, 12
manytooth conger	*Conger triporiceps*	Reef	3-55	C/R	10
blackgut conger	*Gnathophis bathytopos*	Bathydemersal	180-370	R	10
longeye conger	*Gnathophis bracheatopos*	Demersal	55-110	R	4, 10
yellow garden eel	*Heteroconger luteolus*	Demersal	18-43	C/R	10
margintail conger	*Paraconger caudilimbatus*	Reef	?-75	C/R	10
yellow conger	*Rhynchoconger flavus*	Demersal	26-183	C/R	10
whiptail conger	*Rhynchoconger gracilior*	Bathydemersal		R	10
threadtail conger	*Uroconger syringinus*	Demersal	44-384	C/R	10
Coryphaenidae					
pompano dolphinfish	*Coryphaena equiselis*	Pelagic	0-?	C/R	1, 3
dolphinfish	*Coryphaena hippurus*	Pelagic	0-85	C/R	1, 3, 12
Cynoglossidae					
largescale tonguefish	*Symphurus minor*	Demersal	18-170	C/R	4
Dactylopteridae					
flying gurnard	*Dactylopterus volitans*	Reef	1-100	C/R	4
Dasyatidae					
southern stingray	*Dasyatis americana*	Reef	0-53	C/R	2, 7, 12

Table A-3 (cont'd)

Fish Species That May Occur in the Site C Range Site and/or the Cable Corridor

Common Name	Scientific Name	Vertical Habitat Category	Depth (m)	Cable and/or Range Overlap	Source
Atlantic stingray	*Dasyatis sabina*	Demersal	0-25	C	12
Derichthyidae					
spoonbill eel	*Nessorhamphus ingolfianus*	Bathypelagic	?-1800	R	10
Diodontidae					
web burrfish	*Chilomycterus antillarum*	Reef	1-44	C/R	4
striped burrfish	*Chilomycterus schoepfii*	Reef	?-11	C	4, 12
balloonfish	*Diodon holocanthus*	Reef	2-100	C/R	4
Echeneididae					
remora	*Remora remora*	Reef	0-100	C/R	12
Elopidae					
ladyfish	*Elops saurus*	Reef	?-50	C/R	12
Ephippidae					
Atlantic spadefish	*Chaetodipterus faber*	Reef	3-35	C	2, 5, 12
Fistularidae					
cornetfishes	*Fistularia* sp(p).	Reef	0-200	C/R	3
Gadidae					
red hake	*Urophycis chuss*	Demersal	35-1152	C/R	12
Carolina hake	*Urophycis earllii*	Demersal	0-81	C/R	4, 12
southern hake	*Urophycis floridana*	Demersal	0-400	C/R	4, 12
spotted hake	*Urophycis regia*	Demersal	0-494	C/R	4
white hake	*Urophycis tenuis*	Demersal	0-980	C/R	12
Gobiidae					
gobies	*Bollmannia* sp.	Demersal	0-110	C/R	4
bridled goby	*Coryphopterus glaucofraenum*	Reef	2-45	C/R	2
yellowprow goby	*Gobiosoma xanthiprora*	Reef	7-26	C	2
blue goby	*Ioglossus calliurus*	Reef	5-50	C/R	2, 3
dwarf goby	*Lythrypnus elasson*	Reef	11-26	C	4
bluegold goby	*Lythrypnus spilus*	Reef	12-26	C	4
Gymnuridae					
smooth butterfly ray	*Gymnura micrura*	Demersal	?-40	C	7
Haemulidae					
black margate	*Anisotremus surinamensis*	Reef	0-20	C	5
margate	*Haemulon album*	Reef	20-60	C/R	5
tomtate	*Haemulon aurolineatum*	Reef	?-30	C	2, 4, 12
French grunt	*Haemulon flavolineatum*	Reef	0-60	C/R	5

Table A-3 (cont'd)

Fish Species That May Occur in the Site C Range Site and/or the Cable Corridor

Common Name	Scientific Name	Vertical Habitat Category	Depth (m)	Cable and/or Range Overlap	Source
Spanish grunt	*Haemulon macrostomum*	Reef	5-25	C	5
sailors choice	*Haemulon parra*	Reef	3-30	C	5
white grunt	*Haemulon plumierii*	Reef	3-40	C	1, 2, 4, 5, 12
blue-striped grunt	*Haemulon sciurus*	Reef	0-30	C	5
striped grunt	*Haemulon striatum*	Reef	10-100	C/R	4
cottonwick	*Haemulon melanurum*	Reef	3-50	C/R	5
pigfish	*Orthopristis chrysoptera*	Reef	3-21	C	6, 12
Holocentridae					
spinycheek soldierfish	*Corniger spinosus*	Demersal	45-275	R	4, 12
squirrelfish	*Holocentrus adscensionis*	Reef	0-180	C/R	2, 4, 12
bigeye soldierfish	*Ostichthys trachypoma*	Reef		C/R	12
deepwater squirrelfish	*Sargocentron bullisi*	Reef	33-110	C/R	4, 12
Istiophoridae					
sailfish	*Istiophorus platypterus*	Pelagic	0-200	C/R	1,6, 12
blue marlin	*Makaira nigricans*	Pelagic	0-200	C/R	1,6, 12
white marlin	*Tetrapturus albidus*	Pelagic	0-150	C/R	6, 12
Labridae					
spotfin hogfish	*Bodianus pulchellus*	Reef	15-120	C/R	2, 4
Spanish hogfish	*Bodianus rufus*	Reef	1-70	C/R	2
creole wrasse	*Clepticus parrae*	Reef	1-40	C	11
greenband wrasse	*Halichoeres bathyphilus*	Reef	27-190	C/R	2, 4
slippery dick	*Halichoeres bivittatus*	Reef	1-15	C	2, 4
puddingwife	*Halichoeres radiatus*	Reef	2-55	C/R	5
green razorfish	*Hemipteronotus splendens*	Reef	3-15	C	2
hogfish	*Lachnolaimus maximus*	Reef	3-30	C	4, 12
tautog	*Tautoga onitis*	Reef	1-75	C/R	2, 12
bluehead	*Thalassoma bifasciatum*	Reef	0-40	C	2, 11
pearly razorfish	*Xyrichtys novacula*	Reef	1-90	C/R	3, 4, 11
Lamnidae					
shortfin mako	*Isurus oxyrinchus*	Reef	0-740	C/R	1, 6, 12
longfin mako	*Isurus paucus*	Pelagic	0-200	C/R	1
Lobotidae					
Atlantic tripletail	*Lobotes surinamensis*	Benthopelagic		C/R	12

Table A-3 (cont'd)

Fish Species That May Occur in the Site C Range Site and/or the Cable Corridor

Common Name	Scientific Name	Vertical Habitat Category	Depth (m)	Cable and/or Range Overlap	Source
Lophiidae					
reticulate goosefish	*Lophiodes reticulatus*	Bathydemersal	64-820	R	4
blackfin goosefish	*Lophius gastrophysus*	Bathydemersal	40-700	R	4
Lutjanidae					
black snapper	*Apsilus dentatus*	Reef	100-300	R	5
queen snapper	*Etelis oculatus*	Bathydemersal	100-450	R	3, 5
mutton snapper	*Lutjanus analis*	Reef	25-95	C/R	1, 5, 12
schoolmaster snapper	*Lutjanus apodus*	Reef	2-63	C/R	5
blackfin snapper	*Lutjanus buccanella*	Reef	20-200	C/R	1, 4, 5
red snapper	*Lutjanus campechanus*	Reef	10-190	C/R	3, 6, 5, 11, 12
cubera snapper	*Lutjanus cyanopterus*	Reef	18-55	C/R	5
gray snapper	*Lutjanus griseus*	Reef	5-180	C/R	1, 5, 12
dog snapper	*Lutjanus jocu*	Reef	9-30	C	5
mahogany snapper	*Lutjanus mahogoni*	Reef	0-100	C/R	5
lane snapper	*Lutjanus synagris*	Reef	10-400	C/R	5
silk snapper	*Lutjanus vivanus*	Reef	90-242	R	1, 5, 12
yellowtail snapper	*Ocyurus chrysurus*	Reef	0-180	C/R	1, 5, 12
wenchman	*Pristipomoides aquilonaris*	Demersal	24-370	C/R	3
vermilion snapper	*Rhomboplites aurorubens*	Demersal	40-300	R	1, 3, 4, 5, 11, 12
Malacanthidae					
blueline tilefish	*Caulolatilus microps*	Demersal	30-236	C/R	1, 4, 5, 12
tilefish	*Lopholatilus chamaeleonticeps*	Demersal	80-540	R	1, 5, 12
sand tilefish	*Malacanthus plumieri*	Reef	10-153	C/R	4, 5, 11, 12
Megalopidae					
tarpon	*Megalops atlanticus*	Reef	0-30	C	6
Mobulidae					
Atlantic manta	*Manta birostris*	Reef	0-24	C	2, 4
Molidae					
ocean sunfish	*Mola mola*	Pelagic	30-480	C/R	4
Monacanthidae					
unicorn filefish	*Aluterus* cf. *monoceros*	Reef	1-50	C/R	4
scrawled filefish	*Aluterus scriptus*	Reef	3-120	C/R	3
filefishes	*Cantherines* sp.	Reef	2-50	C/R	3
fringed filefish	*Monacanthus ciliatus*	Reef	0-50	C/R	3, 4

Table A-3 (cont'd)

Fish Species That May Occur in the Site C Range Site and/or the Cable Corridor

Common Name	Scientific Name	Vertical Habitat Category	Depth (m)	Cable and/or Range Overlap	Source
planehead filefish	*Stephanolepis hispida*	Reef	0-80	C/R	2, 3
Moridae					
shortbeard codling	*Laemonema barbatulum*	Benthopelagic	50-1620	R	4
Moringuidae					
spaghetti eel	*Moringua edwardsi*	Reef	0-21	C	10
ridged eel	*Neoconger mucronatus*	Demersal	13-180	C/R	10
Moronidae					
white perch	*Morone americana*	Demersal	10-?	C	12
striped bass	*Morone saxatilis*	Demersal	0-30	C	6, 12
Mugilidae					
striped mullet	*Mugil cephalus*	Benthopelagic	0-120	C/R	6, 12
Mullidae					
yellow goatfish	*Mulloidichthys martinicus*	Reef	?-49	C/R	2
spotted goatfish	*Pseudupeneus maculatus*	Reef	?-90	C/R	4, 2
Muraenidae					
pygmy moray	*Anarchias similis*	Reef	0-180	C/R	10, 12
saddled moray	*Gymnothorax conspersus*	Bathydemersal	100-310	R	10, 12
lichen moray	*Gymnothorax hubbsi*	Demersal	60-180	R	4, 10, 12
blacktail moray	*Gymnothorax kolpos*	Demersal	?-120	R	10, 12
sharktooth moray	*Gymnothorax maderensis*	Demersal	85-200	R	10, 12
conger moray	*Gymnothorax miliaris*	Reef	0-60	C/R	10, 12
spotted moray	*Gymnothorax moringa*	Reef	0-200	C/R	2, 3, 4, 10, 12
moray eel	*Gymnothorax ocellatus*	Reef	1-160	C/R	3, 12
spotted moray	*Gymnothorax polygonius*	Demersal	10-256	C/R	4, 10, 12
honeycomb moray	*Gymnothorax saxicola*	Demersal	10-19	C	4, 10, 12
purplemouth moray	*Gymnothorax vicinus*	Reef	?-145	C/R	10, 12
redface eel	*Monopenchelys acuta*	Demersal	13-54	C/R	10, 12
reticulate moray	*Muraena retifera*	Demersal	15-76	C/R	2, 4, 10, 12
stout moray	*Muraena robusta*	Demersal	0-45	C/R	4, 10, 12
marbled moray	*Uropterygius macularius*	Reef	?-137	C/R	10, 12
Myliobatidae					
spotted eagle ray	*Aetobatus narinari*	Reef	1-80	C/R	7

Table A-3 (cont'd)

Fish Species That May Occur in the Site C Range Site and/or the Cable Corridor

Common Name	Scientific Name	Vertical Habitat Category	Depth (m)	Cable and/or Range Overlap	Source
Myxinidae					
Atlantic hagfish	*Myxine glutinosa*	Demersal	40-1200	R	4
Nemichthydidae					
snipe eel	*Labichthys carinatus*	Pelagic	?-2000	C/R	10
boxer snipe eel	*Nemichthys curvirostris*	Bathypelagic	0-2000	C/R	10
Atlantic snipe eel	*Nemichthys scolopaceus*	Bathypelagic	91-2000	R	10
Nettastomatidae					
blacktail pikeconger	*Hoplunnis diomediana*	Demersal	?-203	C/R	10
freckled pikeconger	*Hoplunnis macrura*	Demersal	55-310	R	10
duckbill eel	*Hoplunnis similis*	Bathydemersal	146-329	R	10
spotted pikeconger	*Hoplunnis tenuis*	Bathydemersal	130-420	R	10
duckbill eel	*Nettenchelys exoria*	Bathydemersal	277-494	R	10
longface eel	*Saurenchelys cognita*	Demersal	59-158	R	10
duckbill eel	*Saurenchelys stylura*	Pelagic		C/R	10
Odontaspididae					
sand tiger shark	*Odontaspis taurus*	Reef	1-191	C/R	1, 2
Ogcocephalidae					
pancake batfish	*Halieutichthys aculeatus*	Reef	45-820	R	4
longnose batfish	*Ogcocephalus corniger*	Demersal	29-230	C/R	4
roughback batfish	*Ogcocephalus parvus*	Reef	29-126	C/R	4
palefin batfish	*Ogcocephalus rostellum*	Demersal	28-228	C/R	4
tricorn batfish	*Zalieutes mcgintyi*	Demersal	?-660	C/R	4
Ophichthidae					
key worm eel	*Ahlia egmontis*	Reef	0-15	C	10
stripe eel	*Aprognathodon platyventris*	Reef	0-16	C	10
academy eel	*Apterichtus ansp*	Demersal		C/R	10
finless eel	*Apterichtus kendalli*	Demersal	3-400	C/R	10
sooty eel	*Bascanichthys bascanium*	Demersal		C/R	10
whip eel	*Bascanichthys scuticaris*	Reef		C/R	10
shorttail snake eel	*Callechelys guineensis*	Demersal	0-35	C	10
blotched snake eel	*Callechelys muraena*	Demersal	27-115	C/R	10
spotted spoon-nose eel	*Echiophis intertinctus*	Demersal	0-100	C/R	10

Table A-3 (cont'd)

Fish Species That May Occur in the Site C Range Site and/or the Cable Corridor

Common Name	Scientific Name	Vertical Habitat Category	Depth (m)	Cable and/or Range Overlap	Source
stippled spoon-nose eel	*Echiophis punctifer*	Reef	0-100	C/R	10
irksome eel	*Gordiichthys ergodes*	Demersal	10-189	C/R	10
string eel	*Gordiichthys leibyi*	Demersal	37-72	C/R	10
finless snake eel	*Ichthyapus ophioneus*	Reef	0-35	C	10
worm eel	*Letharchus aliculatus*	Demersal	0-1	C	10
sailfin eel	*Letharchus velifer*	Demersal		C/R	10
sharptail eel	*Myrichthys breviceps*	Reef	0-9	C	4, 10
goldspotted eel	*Myrichthys ocellatus*	Reef	2-12	C	10
broadnose worm eel	*Myrophis platyrhynchus*	Demersal		C	10
speckled worm eel	*Myrophis punctatus*	Reef	0-20	C	10
margined snake eel	*Ophichthus cruentifer*	Demersal	36-1350	C/R	10
shrimp eel	*Ophichthus gomesii*	Demersal	1-450	C/R	10
blackpored eel	*Ophichthus melanoporus*	Demersal		C/R	10
worm eel	*Ophichthus menezesi*	Demersal		C/R	10
palespotted eel	*Ophichthus puncticeps*	Demersal	0-150	C/R	4,10
diminutive worm eel	*Pseudomyrophis fugesae*	Demersal		C/R	10
elongate worm eel	*Pseudomyrophis nimius*	Demersal		C/R	10
blackspotted snake eel	*Quassiremus ascensionis*	Reef	0-12	C	10
Ophididae					
Atlantic bearded brotula	*Brotula barbata*	Reef	?-650	C/R	4
fawn cusk-eel	*Lepophidium profundorum*	Demersal	55-365	R	4
barred cusk-eel	*Lepophidium staurophor*	Bathydemersal	180-485	R	4
mooneye cusk-eel	*Ophidion selenops*	Reef	12-45	C/R	3, 11
polka-dot cusk-eel	*Otophidium omostigma*	Demersal	10-50	C/R	3, 11
Ostraciidae					
scrawled cowfish	*Acanthostracion quadricornis*	Reef	?-80	C/R	4
Paralichthyidae					
three-eye flounder	*Ancylopsetta dilecta*	Demersal		C/R	4
gulf stream flounder	*Citharichthys arctifrons*	Demersal	46-365	R	4
horned whiff	*Citharichthys cornutus*	Bathydemersal	30-400	C/R	4, 11

Table A-3 (cont'd)

Fish Species That May Occur in the Site C Range Site and/or the Cable Corridor

Common Name	Scientific Name	Vertical Habitat Category	Depth (m)	Cable and/or Range Overlap	Source
anglefin whiff	*Citharichthys gymnorhinus*	Demersal	35-200	C/R	4, 11
smallmouth flounder	*Etropus microstomus*	Demersal	?-90	C/R	4, 11
Gulf flounder	*Paralichthys albigutta*	Demersal	19-130	C/R	12
summer flounder	*Paralichthys dentatus*	Demersal	0-146	C/R	1, 12
southern flounder	*Paralichthys lethostigma*	Demersal	0-40	C	12
dusky flounder	*Syacium papillosum*	Reef	10-140	C/R	3, 4
Peristediidae					
searobins	*Peristedion* spp.	Demersal	?-910	C/R	4, 11
Pleuronectidae					
witch flounder	*Glyptocephalus cynoglossus*	Demersal	45-1460	C/R	12
Polyprionidae					
wreckfish	*Polyprion americanus*	Bathydemersal	40-600	R	1, 5
Pomacanthidae					
cherubfish	*Centropyge argi*	Reef	5-80	C/R	11
blue chromis	*Chromis cyaneus*	Reef	3-60	C/R	2
yellowtail reeffish	*Chromis enchrysura*	Reef	5-146	C/R	2, 4
sunshinefish	*Chromis insolata*	Reef	20-100	C/R	2, 4
purple reeffish	*Chromis scotti*	Reef	15-116	C/R	2, 4
blue angelfish	*Holacanthus bermudensis*	Reef	2-92	C/R	2
queen angelfish	*Holacanthus ciliaris*	Reef	1-70	C/R	2
angelfishes	*Holacanthus* sp(p).	Reef	1-92	C/R	3
damselfishes	*Pomacentrus* sp(p).	Reef	0-100	C/R	3
dusky damselfish	*Stegastes adustus*	Reef	0-3	C	2, 4
beaugregory	*Stegastes leucostictus*	Reef	0-10	C	2
bicolor damselfish	*Stegastes partitus*	Reef	0-100	C/R	2
cocoa damselfish	*Stegastes variabilis*	Reef	0-30	C	2
Pomatomidae					
bluefish	*Pomatomus saltatrix*	Pelagic	0-200	C/R	1, 6, 12
Priacanthidae					
bigeye	*Priacanthus arenatus*	Reef	10-200	C/R	2, 4, 12
short bigeye	*Pristigenys alta*	Reef	5-200	C/R	3, 4
Ptereleotridae					
dartfishes	*Ptereleotris* spp.	Reef	3-60	C/R	4
Rachycentridae					
cobia	*Rachycentron canadum*	Reef	0-1200	C/R	1, 6, 12

Table A-3 (cont'd)

Fish Species That May Occur in the Site C Range Site and/or the Cable Corridor

Common Name	Scientific Name	Vertical Habitat Category	Depth (m)	Cable and/or Range Overlap	Source
Rajidae					
clearnose skate	*Raja eglanteria*	Demersal	0-330	C/R	7, 12
little skate	*Raja erinacea*	Demersal	0-90	C/R	7, 12
barndoor skate	*Dipturus laevis*	Demersal	0-750	C/R	7, 12
winter skate	*Raja ocellata*	Demersal	0-90	C/R	7, 12
Rhinopteridae					
cownose ray	*Rhinoptera bonasus*	Benthopelagic	0-22	C	7, 12
Scaridae					
striped parrotfish	*Scarus croicensis*	Reef	3-25	C	2
greenblotch parrotfish	*Sparisoma atomarium*	Reef	20-55	C/R	2
Sciaenidae					
silver perch	*Bairdiella chrysoura*	Demersal		C	6, 12
spotted seatrout	*Cynoscion nebulosus*	Demersal	0-10	C	6, 11
weakfish	*Cynoscion regalis*	Demersal	10-26	C	11, 12
high-hat	*Equetus acuminatus*	Reef	5-18	C	2
jackknife fish	*Equetus lanceolatus*	Reef	10-60	C/R	4
cubbyu	*Equetus umbrosus*	Reef	5-91	C/R	2, 12
banded drum	*Larimus fasciatus*	Demersal	0-60	C/R	11
spot	*Leiostomus xanthurus*	Demersal	0-60	C/R	6, 12
southern kingfish	*Menticirrhus americanus*	Demersal	0-40	C	6, 12
Gulf kingfish	*Menticirrhus littoralis*	Demersal	10-?	C	12
northern kingfish	*Menticirrhus saxatilis*	Demersal	0-10	C	6, 12
Atlantic croaker	*Micropogonias undulatus*	Demersal	0-100	C/R	6, 12
blackbar drum	*Pareques iwamotoi*	Demersal	37-184	C/R	4
cubbyu	*Pareques umbrosus*	Reef	5-91	C/R	4
black drum	*Pogonias cromis*	Demersal	0-10	C	6, 12
red drum	*Sciaenops ocellatus*	Demersal	0-10	C	1, 6, 12
Scombridae					
wahoo	*Acanthocybium solandri*	Pelagic	0-12	C	1, 6, 12
frigate mackerels	*Auxis* sp(p).	Pelagic	0-50	C/R	3
little tunny	*Euthynnus alletteratus*	Pelagic	1-150	C/R	6, 12
skipjack tuna	*Katsuwonus pelamis*	Pelagic	0-260	C/R	6, 12
Atlantic bonito	*Sarda sarda*	Pelagic	80-200	R	6, 12
king mackerel	*Scomberomorus cavalla*	Pelagic	5-140	C/R	1, 4, 12
Spanish mackerel	*Scomberomorus maculatus*	Reef	10-35	C	1, 6, 12
Atlantic mackerel	*Scomber scombrus*	Pelagic	0-1000	C/R	12

Table A-3 (cont'd)

Fish Species That May Occur in the Site C Range Site and/or the Cable Corridor

Common Name	Scientific Name	Vertical Habitat Category	Depth (m)	Cable and/or Range Overlap	Source
albacore tuna	*Thunnus alalunga*	Pelagic	0-600	C/R	6, 12
yellowfin tuna	*Thunnus albacares*	Pelagic	1-250	C/R	6, 12
blackfin tuna	*Thunnus atlanticus*	Pelagic	50-?	R	6, 12
bigeye tuna	*Thunnus obesus*	Pelagic	0-250	C/R	6, 12
Atlantic bluefin tuna	*Thunnus thynnus*	Pelagic	0-9850	C/R	1, 6, 12
Scorpaenidae					
lionfish	*Pterois volitans*	Reef	2-55	C/R	4
longfin scorpionfish	*Scorpaena agassizii*	Reef	46-275	R	4, 12
barbfish	*Scorpaena brasiliensis*	Reef	1-100	C/R	4, 12
hunchback scorpionfish	*Scorpaena dispar*	Reef	36-118	C/R	4,12
Serranidae					
yellowfin bass	*Anthias nicholsi*	Benthopelagic		C/R	4
bank sea bass	*Centropristis ocyurus*	Demersal	18-76	C/R	2, 4, 5, 6,12
rock sea bass	*Centropristis philadelphica*	Reef		C/R	5, 12
black sea bass	*Centropristis striata*	Reef	1-?	C/R	2, 6, 5, 12
graysby	*Cephalopholis cruentata*	Reef	0-170	C/R	3, 4, 5, 12
coney	*Cephalopholis fulva*	Reef	2-150	C/R	4, 5
sand perch	*Diplectrum formosum*	Reef	1-80	C/R	3, 12
rock hind	*Epinephelus adscensionis*	Demersal	1-120	C/R	4, 5, 12
speckled hind	*Epinephelus drummondhayi*	Demersal	25-183	C/R	1, 2, 4, 5
yellowedge grouper	*Epinephelus flavolimbatus*	Demersal	64-275	R	1, 3, 5, 12
red hind	*Epinephelus guttatus*	Reef	2-100	C/R	5, 12
goliath grouper	*Epinephelus itajara*	Reef	?-100	C/R	1, 5
red grouper	*Epinephelus morio*	Reef	5-330	C/R	5, 6, 12
misty grouper	*Epinephelus mystacinus*	Bathydemersal	30-400	C/R	5
Warsaw grouper	*Epinephelus nigritus*	Demersal	55-525	C/R	1, 4, 5
snowy grouper	*Epinephelus niveatus*	Demersal	30-525	C/R	1, 4, 5, 12
Nassau grouper	*Epinephelus striatus*	Reef	1-90	C/R	5, 6
Spanish flag	*Gonioplectrus hispanus*	Demersal	35-365	C/R	4
red barbier	*Hemanthias vivanus*	Benthopelagic	45-610	R	2, 3, 4
eyestripe bass	*Liopropoma aberrans*	Demersal		C/R	4
wrasse bass	*Liopropoma eukrines*	Reef	30-150	C/R	4, 2
cave bass	*Liopropoma mowbrayi*	Reef	30-60	C/R	4

Table A-3 (cont'd)

Fish Species That May Occur in the Site C Range Site and/or the Cable Corridor

Common Name	Scientific Name	Vertical Habitat Category	Depth (m)	Cable and/or Range Overlap	Source
black grouper	*Mycteroperca bonaci*	Reef	6-33	C	5
yellowmouth grouper	*Mycteroperca interstitialis*	Reef	2-150	C/R	4, 5, 12
gag	*Mycteroperca microlepis*	Reef	40-152	R	2, 4, 5, 6, 12
scamp	*Mycteroperca phenax*	Reef	30-100	C/R	1, 2, 4, 5, 6, 12
tiger grouper	*Mycteroperca tigris*	Reef	10-40	C	5
yellowfin grouper	*Mycteroperca venenosa*	Reef	2-137	C/R	5, 12
Atlantic creolefish	*Paranthias furcifer*	Reef	8-100	C/R	4
bantam bass	*Parasphyraenops incisus*	Demersal	30-60	C/R	4
whitespotted soapfish	*Rypticus maculatus*	Demersal	5-140	C/R	2, 12
greater soapfish	*Rypticus saponaceus*	Reef	1-62	C/R	4
school bass	*Schultzea beta*	Reef	15-110	C/R	4
orangeback bass	*Serranus annularis*	Reef	10-70	C/R	4
snow bass	*Serranus chionaraia*	Reef	45-90	R	4
saddle bass	*Serranus notospilus*	Reef	75-165	C/R	4
tattler	*Serranus phoebe*	Reef	27-400	C/R	4
belted sandfish	*Serranus subligarius*	Demersal	?-18	C	2
harlequin bass	*Serranus tigrinus*	Reef	0-40	C	2
Serrivomeridae					
sawtooth eel	*Serrivomer beanii*	Bathypelagic	10-4550	C/R	10
Sparidae					
sheepshead	*Archosargus probatocephalus*	Reef	1-12	C	2, 5, 11, 12
grass porgy	*Calamus arctifrons*	Demersal		C/R	5
jolthead porgy	*Calamus bajonado*	Reef	3-200	C/R	5, 12
saucereye porgy	*Calamus calamus*	Reef	1-75	C/R	5
whitebone porgy	*Calamus leucosticus*	Demersal	10-100	C/R	5, 12
knobbed porgy	*Calamus nodosus*	Reef	7-90	C/R	2, 4, 5, 12
silver porgy	*Diplodus argenteus*	Reef	0-24	C	12
spottail pinfish	*Diplodus holbrooki*	Demersal	?-28	C	2, 12
pinfish	*Lagodon rhomboides*	Demersal	1-20	C	2, 11, 12
red porgy	*Pagrus pagrus*	Benthopelagic	0-250	C/R	4, 2, 6, 5, 12
longspine porgy	*Stenotomus caprinus*	Demersal	5-185	C/R	5, 12
scup	*Stenotomus chrysops*	Demersal	15-?	C/R	5, 12
Sphyraenidae					
great barracuda	*Sphyraena barracuda*	Reef	1-100	C/R	2, 4, 12

Table A-3 (cont'd)

Fish Species That May Occur in the Site C Range Site and/or the Cable Corridor

Common Name	Scientific Name	Vertical Habitat Category	Depth (m)	Cable and/or Range Overlap	Source
Sphyrnidae					
scalloped hammerhead shark	*Sphyrna lewini*	Reef	0-512	C/R	1, 6, 12
Squalidae					
spiny dogfish	*Squalus acanthias*	Benthopelagic	0-1460	C/R	1, 2, 12
Sternoptychidae					
Atlantic pearlside	*Maurolicus weitzmani*	Bathypelagic		R	4
Stromateidae					
harvestfish	*Peprilus alepidotus*	Benthopelagic		C/R	12
butterfish	*Peprilus triacanthus*	Benthopelagic	15-?	C/R	6, 11, 12
Synaphobranchidae					
blind arrowtooth eel	*Dysomma anguillare*	Demersal	30-270	C/R	10
arrowtooth eel	*Dysommina rugosa*	Bathydemersal	260-775	R	10
deepwater cutthroat eel	*Histiobranchus bathybius*	Benthopelagic	295-5440	R	10
pugnose eel	*Simenchelys parasitica*	Bathydemersal	136-2620	R	10
cutthroat eel	*Synaphobranchus affinis*	Bathydemersal	290-2400	R	10
longnosed eel	*Synaphobranchus kaupii*	Bathydemersal	120-4800	R	10
Syngnathidae					
deepwater pipefish	*Cosmocampus* cf. *profundus*	Bathydemersal	180-270	R	4
lined seahorse	*Hippocampus erectus*	Reef	1-73	C/R	3, 4, 11
Synodontidae					
largescale lizardfish	*Saurida brasiliensis*	Demersal	18-410	C/R	4
inshore lizardfish	*Synodus foetens*	Reef	0-200	C/R	12
sand diver	*Synodus intermedius*	Reef	3-320	C/R	4, 2
offshore lizardfish	*Synodus poeyi*	Reef	27-320	C/R	4, 12
red lizardfish	*Synodus synodus*	Reef	1-40	C/R	4
bluntnose lizardfish	*Trachinocephalus myops*	Reef	1-396	C/R	4
Tetraodontidae					
sharpnose puffer	*Canthigaster rostrata*	Reef	1-40	C	4
bandtail puffer	*Sphoeroides* cf. *splengeri*	Reef	2-70	C/R	4, 2
northern puffer	*Sphoeroides maculatus*	Demersal	10-?	C/R	6, 12
Triacanthodidae					
jambeau	*Parahollardia lineata*	Demersal	119-396	R	4

Table A-3 (cont'd)

Fish Species That May Occur in the Site C Range Site and/or the Cable Corridor

Common Name	Scientific Name	Vertical Habitat Category	Depth (m)	Cable and/or Range Overlap	Source
Triakidae					
smooth dogfish	*Mustelus canis*	Demersal	0-800	C/R	12
Trichiuridae					
Atlantic cutlassfish	*Trichiurus lepturus*	Benthopelagic	0-400	C/R	12
Triglidae					
shortfin searobin	*Bellator brachychir*	Demersal	35-200	C/R	4, 12
streamer searobin	*Bellator egretta*	Demersal		C/R	4, 12
horned searobin	*Bellator militaris*	Demersal	40-110	R	4, 12
northern searobin	*Prionotus carolinus*	Demersal	15-170	C/R	12
striped searobin	*Prionotus evolans*	Reef	0-180	C/R	12
bluespotted searobin	*Prionotus roseus*	Demersal		C/R	4, 12
Uranoscopidae					
lancer stargazer	*Kathetostoma albigutta*	Demersal	40-385	R	4, 12
Xiphiidae					
swordfish	*Xiphias gladius*	Pelagic	0-800	C/R	1, 6, 12
Zeidae					
American john dory	*Zenopsis conchifera*	Benthopelagic	50-600	R	12

Source: (1) Department of the Navy 2007; (2) East Carolina University 2007; (3) Powell et al. 1999; (4) Quattrini and Ross 2006; (5) SAFMC 2007; (6) NCDMF 2007; (7) North Carolina Aquarium 2007; (8) NOAA 2007; (9) Hare and Govoni 2006; (10) Ross et al. 2007; (11) Grothues and Cowen 1999; (12) NMFS 2007.

Available depth information and Cable and/or Range Overlap (C/R [cable and range], C [cable only], R [range only]) assignment based on Bigelow and Schroeder 1953, Bohlke and Chaplin 1993, Humann and DeLoach 2002, and www.fishbase.org (accessed May 2007).

Table A-4

Fish Species That May Occur in the Site D Range Site and/or the Cable Corridor

Common Name	Scientific Name	Vertical Habitat Category	Depth (m)	Cable and/or Range Overlap	Source
Acipenseridae					
shortnose sturgeon	*Acipenser brevirostrum*	Demersal		C	6
Atlantic sturgeon	*Acipenser oxyrinchus oxyrinchus*	Demersal	0-46	C	6
Alopiidae					
thresher shark	*Alopias vulpinus*	Pelagic	0-550	C/R	6
Ammodytidae					
northern sand lance	*Ammodytes dubius*	Demersal	0-36	C	3
Anguillidae					
American eel	*Anguilla rostrata*	Demersal	0-464	C/R	2, 6
Argentinidae					
Atlantic argentine	*Argentina silus*	Bathydemersal	140-1440	R	3
Atherinopsidae					
rough silverside	*Membras martinica*	Pelagic		C/R	3
Balistidae					
gray triggerfish	*Balistes capriscus*	Reef	0-100	C/R	6
Batrachoididae					
oyster toadfish	*Opsanus tau*	Reef		C	
Belonidae					
Atlantic needlefish	*Strongylura marina*	Reef	1-?	C	3
Carangidae					
African pompano	*Alectis ciliaris*	Reef	60-100	R	12
crevalle jack	*Caranx hippos*	Reef	1-350	C/R	2, 6
round scad	*Decapterus punctatus*	Reef	0-100	C/R	3
leatherjacket	*Oligoplites saurus*	Reef		C	6
bigeye scad	*Selar crumenophthalmus*	Reef	0-170	C/R	3
amberjacks	*Seriola sp.*	Reef	1-360	C/R	6
lesser amberjack	*Seriola fasciata*	Benthopelagic	55-130	R	6
banded rudderfish	*Seriola zonata*	Benthopelagic		C/R	6
Florida pompano	*Trachinotus carolinus*	Benthopelagic	?-70	C/R	3, 6
rough scad	*Trachurus lathami*	Reef	30-90	C/R	3
Carcharhinidae					
bignose shark	*Carcharhinus altimus*	Reef	25-500	C/R	1
dusky shark	*Carcharhinus obscurus*	Reef	0-400	C/R	1, 6
sandbar shark	*Carcharhinus plumbeus*	Reef	?-1800	C/R	1, 6
night shark	*Carcharhinus signatus*	Benthopelagic	0-600	C/R	1

Table A-4 (cont'd)

Fish Species That May Occur in the Site D Range Site and/or the Cable Corridor

Common Name	Scientific Name	Vertical Habitat Category	Depth (m)	Cable and/or Range Overlap	Source
tiger shark	*Galeocerdo cuvier*	Reef	0-350	C/R	1
blue shark	*Prionace glauca*	Pelagic	0-350	C/R	1
Atlantic sharpnose shark	*Rhizoprionodon terraenovae*	Demersal	10-280	C/R	1
Cetorhinidae					
basking shark	*Cetorhinus maximus*	Pelagic	0-2000	C/R	1
Chlorophthalmidae					
shortnose greeneye	*Chlorophthalmus agassizi*	Bathydemersal	50-1000	C/R	3
Clupeidae					
blueback herring	*Alosa aestivalis*	Pelagic	5-?	C/R	6
hickory shad	*Alosa mediocris*	Pelagic		C/R	6
alewife	*Alosa pseudoharengus*	Pelagic	5-145	C/R	6
American shad	*Alosa sapidissima*	Pelagic	0-250	C/R	6
Atlantic menhaden	*Brevoortia tyrannus*	Pelagic	0-50	C	2, 6
Atlantic herring	*Clupea harengus*	Benthopelagic	0-200	C/R	1, 6
American gizzard shad	*Dorosoma cepedianum*	Pelagic	?-33	C	6
Congridae					
conger eel	*Conger oceanicus*	Demersal	1-477	C/R	5, 6
Coryphaenidae					
dolphinfish	*Coryphaena hippurus*	Pelagic	0-85	C/R	6
pompano dolphinfish	*Coryphaena equiselis*	Pelagic	0-?	C/R	6
Cottidae					
longhorn sculpin	*Myoxocephalus octodecemspinosus*	Demersal	0-192	C/R	3
Cryptacanthodidae					
wrymouth	*Cryptacanthodes maculatus*	Demersal	?-110	C/R	3
sheepshead minnow	*Cyprinodon variegatus*	Benthopelagic		C	2, 6
Dasyatidae					
southern stingray	*Dasyatis americana*	Reef	0-53	C	6
Engraulidae					
bay anchovy	*Anchoa mitchilli*	Reef	1-36	C	5
Ephippidae					
Atlantic spadefish	*Chaetodipterus faber*	Reef	3-35	C	6
Etmopteridae					
black dogfish	*Centroscyllium fabricii*	Bathydemersal	180-1600	R	3

Table A-4 (cont'd)

Fish Species That May Occur in the Site D Range Site and/or the Cable Corridor

Common Name	Scientific Name	Vertical Habitat Category	Depth (m)	Cable and/or Range Overlap	Source
Fistulariidae					
bluespotted cornetfish	*Fistularia tabacaria*	Reef	?-200	C/R	2
Fundulidae					
common mummichog	*Fundulus heteroclitus*	Benthopelagic		C	2
striped killifish	*Fundulus majalis*	Benthopelagic		C	2
Gadidae					
fourbeard rockling	*Enchelyopus cimbrius*	Demersal	20-650	C/R	3, 4
Atlantic cod	*Gadus morhua*	Benthopelagic	0-600	C/R	1, 4, 6
haddock	*Melanogrammus aeglefinus*	Demersal	10-450	C/R	1, 3
longfin hake	*Phycis chesteri*	Benthopelagic	90-1400	R	1, 3
pollock	*Pollachius virens*	Demersal	0-200	C/R	6
red hake	*Urophycis chuss*	Demersal	35-1152	C/R	1, 3
southern hake	*Urophycis floridana*	Demersal	0-400	C/R	6
spotted hake	*Urophycis regia*	Demersal	0-494	C/R	3
white hake	*Urophycis tenuis*	Demersal	0-980	C/R	1, 3
Gasterosteidae					
threespine stickleback	*Gasterosteus aculeatus*	Benthopelagic	0-100	C/R	3
Gymnuridae					
smooth butterfly ray	*Gymnura micrura*	Demersal	?-40	C	6
Haemulidae					
pigfish	*Orthopristis chrysoptera*	Demersal	10-?	C/R	
Hemiramphidae					
sea raven	*Hemitripterus americanus*	Demersal	0-180	C/R	3
halfbeak	*Hyporhamphus unifasciatus*	Reef	0-5	C	3
Istiophoridae					
blue marlin	*Makaira nigricans*	Pelagic	0-200	C/R	1,3, 6
white marlin	*Tetrapturus albidus*	Pelagic	0-150	C/R	1, 6
Labridae					
cunner	*Tautogolabrus adspersus*	Reef	0-10	C	6
tautog	*Tautoga onitis*	Reef	1-75	C/R	3, 6
Lamnidae					
shortfin mako shark	*Isurus oxyrinchus*	Reef	0-740	C/R	1

Table A-4 (cont'd)

Fish Species That May Occur in the Site D Range Site and/or the Cable Corridor

Common Name	Scientific Name	Vertical Habitat Category	Depth (m)	Cable and/or Range Overlap	Source
longfin mako shark	*Isurus paucus*	Pelagic	0-200	C/R	1
Lophiidae					
goosefish	*Lophius americanus*	Demersal	0-668	C/R	1, 6
Lutjanidae					
vermilion snapper	*Rhomboplites aurorubens*	Demersal	40-300	R	3
Macrouridae					
roughnose grenadier	*Trachyrincus murrayi*	Benthopelagic	0-1625	C/R	3
Malacanthidae					
tilefish	*Lopholatilus chamaeleonticeps*	Demersal	80-540	R	1, 3, 6
Merlucciidae					
offshore hake	*Merluccius albidus*	Bathydemersal	80-1170	R	1, 3, 6
silver hake/whiting	*Merluccius bilinearis*	Demersal	55-914	R	1
Monacanthidae					
planehead filefish	*Stephanolepis hispida*	Reef	?-80	C/R	3, 6
Moronidae					
white perch	*Morone americana*	Demersal	10-?	C	6
striped bass	*Morone saxatilis*	Demersal	30-?	C	6
Mugilidae					
white mullet	*Mugil curema*	Reef	0-9	C	3, 6
Myctophidae					
glacier lanternfish	*Benthosema glaciale*	Pelagic	0-1085	C/R	4
horned lanternfish	*Ceratoscopelus maderensis*	Bathypelagic	51-1082	C/R	4
lanternfish	*Protomyctophum arcticum*	Pelagic	90-850	R	3
Myliobatidae					
cownose ray	*Rhinoptera bonasus*	Benthopelagic	0-22	C	6
bullnose eagle ray	*Myliobatis freminvillii*	Benthopelagic	0-100	C/R	6
Myxinidae					
Atlantic hagfish	*Myxine glutinosa*	Demersal	40-1200	C/R	3
Nomeidae					
driftfish	*Psenes sp.*	Pelagic	0-1000	C/R	3
Odontaspididae					
sand tiger shark	*Odontaspis taurus*	Reef	1-191	C/R	1, 6
Ophidiidae					
fawn cusk-eel	*Lepophidium profundorum*	Demersal	55-365	R	3
bank cusk-eel	*Ophidion holbrookii*	Reef	0-75	C/R	3

Table A-4 (cont'd)

Fish Species That May Occur in the Site D Range Site and/or the Cable Corridor

Common Name	Scientific Name	Vertical Habitat Category	Depth (m)	Cable and/or Range Overlap	Source
striped cusk-eel	*Ophidion marginatum*	Demersal		C/R	3
Paralichthyidae					
gulf stream flounder	*Citharichthys arctifrons*	Demersal	46-365	C/R	3, 4
fringed flounder	*Etropus crossotus*	Demersal	0-65	C/R	4
smallmouth flounder	*Etropus microstomus*	Demersal	?-90	C/R	3, 4
fourspot flounder	*Hippoglossina oblonga*	Demersal	0-275	C/R	3
summer flounder	*Paralichthys dentatus*	Demersal	10-?	C	1, 6
Pleuronectidae					
witch flounder	*Glyptocephalus cynoglossus*	Demersal	45-1460	C/R	1, 4, 6
yellowtail flounder	*Limanda ferruginea*	Demersal	36-82	C/R	1
winter flounder	*Pseudopleuronectes americanus*	Demersal	5-100	C/R	1, 3, 6
Polymixiidae					
beardfish	*Polymixia lowei*	Bathydemersal	50-600	C/R	3
Pomatomidae					
bluefish	*Pomatomus saltatrix*	Pelagic	0-200	C/R	1, 6
Rachycentridae					
cobia	*Rachycentron canadum*	Reef	0-200	C/R	1, 6
Rajidae					
barndoor skate	*Dipturus laevis*	Demersal	0-750	C/R	6
rosette skate	*Leucoraja garmani*	Reef	55-530	R	1, 3
clearnose skate	*Raja eglanteria*	Demersal	0-330	C/R	1, 3, 6
little skate	*Raja erinacea*	Demersal	0-90	C/R	1, 3
winter skate	*Raja ocellata*	Demersal	0-90	C/R	1, 3
Sciaenidae					
weakfish	*Cynoscion regalis*	Demersal	10-26	C	5, 6
spotted seatrout	*Cynoscion nebulosus*	Demersal	10-?	C	6
spot	*Leiostomus xanthurus*	Demersal	?-60	C/R	3
southern kingfish	*Menticirrhus americanus*	Demersal	?-40	C	6
Gulf kingfish	*Menticirrhus littoralis*	Demersal	10-?	C	3, 6
northern kingfish	*Menticirrhus saxatilis*	Demersal	10-?	C	3, 6
Altantic croaker	*Micropogonias undulatus*	Demersal	?-100	C/R	3, 6
black drum	*Pogonias cromis*	Demersal	10-?	C	6
red drum	*Sciaenops ocellatus*	Demersal	10-?	C	1, 6

Table A-4 (cont'd)

Fish Species That May Occur in the Site D Range Site and/or the Cable Corridor

Common Name	Scientific Name	Vertical Habitat Category	Depth (m)	Cable and/or Range Overlap	Source
king mackerel	*Scomberomorus cavalla*	Reef	5-140	C/R	1, 6
Scombridae					
wahoo	*Acanthocybium solandri*	Pelagic	0-12	C	6
little tunny	*Euthynnus alletteratus*	Reef	1-150	C/R	6
skipjack tuna	*Katsuwonus pelamis*	Pelagic	0-260	C/R	1, 6
Atlantic mackerel	*Scomber scombrus*	Pelagic	0-1000	C/R	1, 3, 6
Spanish mackerel	*Scomberomorus maculatus*	Reef	10-35	C	1
Atlantic bonito	*Sarda sarda*	Pelagic	80-200	R	6
albacore tuna	*Thunnus alalunga*	Pelagic	0-600	C/R	1, 6
yellowfin tuna	*Thunnus albacares*	Pelagic	1-250	C/R	1, 6
bigeye tuna	*Thunnus obesus*	Pelagic	0-250	C/R	1
bluefin tuna	*Thunnus thynnus*	Pelagic	0-9850	C/R	1, 6
Scophthalmidae					
windowpane flounder	*Scophthalmus aquosus*	Demersal	0-45	C	1, 6
Scorpaenidae					
blackbelly rosefish	*Helicolenus dactylopterus*	Bathydemersal	50-1100	C/R	3
Serranidae					
bank sea bass	*Centropristis ocyurus*	Demersal	18-76	C/R	3
black sea bass	*Centropristis striata*	Reef	2-37	C	1, 3, 5, 6
tattler	*Serranus phoebe*	Reef	27-400	C/R	3
Sparidae					
sheepshead seabream	*Archosargus probatocephalus*	Reef	15-?	C	6
pinfish	*Lagodon rhomboides*	Demersal		C	6
longspine porgy	*Stenotomus caprinus*	Demersal	5-185	C/R	3
scup	*Stenotomus chrysops*	Demersal	0-15	C	1, 6
Sphyraenidae					
barracudas	*Sphyraena sp.*	Pelagic	0-300	C/R	3, 6
great barracuda	*Sphyraena barracuda*	Reef	1-100	C/R	6
Squalidae					
scalloped hammerhead shark	*Sphyrna lewini*	Reef	0-512	C/R	1, 6
spiny dogfish	*Squalus acanthias*	Benthopelagic	0-1460	C/R	1, 6
Squatinidae					
Atlantic angel shark	*Squatina dumeril*	Demersal	0-1390	C/R	1

Table A-4 (cont'd)

Fish Species That May Occur in the Site D Range Site and/or the Cable Corridor

Common Name	Scientific Name	Vertical Habitat Category	Depth (m)	Cable and/or Range Overlap	Source
Sternoptychidae					
pearlside	*Maurolicus muelleri*	Bathypelagic	0-1524	C/R	3
Stromateidae					
harvestfish	*Peprilus alepidotus*	Benthopelagic		C/R	6
butterfish	*Peprilus triacanthus*	Benthopelagic	15-?	C/R	1, 3, 6
Syngnathidae					
northern pipefish	*Syngnathus fuscus*	Demersal	5-366	C/R	3
Synodontidae					
inshore lizardfish	*Synodus foetens*	Reef	0-200	C/R	6
offshore lizardfish	*Synodus poeyi*	Reef	27-320	C/R	3
Tetraodontidae					
northern puffer	*Sphoeroides maculatus*	Demersal	0-10	C	3, 6
Triakidae					
smooth dogfish	*Mustelus canis*	Demersal	0-800	C/R	3, 6
Trichiuridae					
Atlantic cutlassfish	*Trichiurus lepturus*	Benthopelagic	0-400	C/R	6
Triglidae					
armored searobin	*Peristedion miniatum*	Bathydemersal	64-910	R	3
northern searobin	*Prionotus carolinus*	Demersal	15-170	C/R	3, 6
striped searobin	*Prionotus evolans*	Reef	0-180	C/R	3
Uranoscopidae					
northern stargazer	*Astroscopus guttatus*	Demersal	?-36	C	2, 6
Xiphiidae					
swordfish	*Xiphias gladius*	Pelagic	0-800	C/R	1, 6
Zeidae					
American john dory	*Zenopsis conchifera*	Benthopelagic	50-600	C/R	3
Zoarcidae					
ocean pout	*Zoarces americanus*	Demersal	0-180	C/R	3

Source: (1) Department of the Navy 2007; (2) Layman 2000; (3) Mahon et al. 1998; (4) Grothues and Cowen 1999; (5) Diaz et al. 2003; (6) NMFS 2007.

Available depth information and Cable and/or Range Overlap (C/R [cable and range], C [cable only], R [range only]) assignment based on Bigelow and Schroeder 1953, Bohlke and Chaplin 1993, Humann and DeLoach 2002, and www.fishbase.org (accessed May 2007).

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APPENDIX B

ESSENTIAL FISH HABITAT ASSESSMENT FOR USWTR ENVIRONMENTAL IMPACT STATEMENT / OVERSEAS ENVIRONMENTAL IMPACT STATEMENT

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Essential Fish Habitat Assessment for the Environmental Impact Statement/ Overseas Environmental Impact Statement

Undersea Warfare Training Range

Contract Number: N62470-02-D-9997

Contract Task Order 0035.04

Department of the Navy

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LIST OF ACRONYMS AND ABBREVIATIONS

~	Approximately
°C	Degree(s) Celsius
°N	Degree(s) North
°W	Degree(s) West
µg/L	Microgram(s) per Liter
%	Percent
ADC	Acoustic Device Countermeasure
ASMFC	Atlantic States Marine Fisheries Commission
ASW	Anti-Submarine Warfare
BLM	Bureau of Land Management
CFR	Code of Federal Regulations
CHASN	Charleston
CHPT	Cherry Point
cm	Centimeter(s)
cm^2	Square Centimeter(s)
DoN	Department of the Navy
EEZ	Exclusive Economic Zone
EFH	Essential Fish Habitat
Eh	Oxidation Potential
EMATT	Expendable Mobile Anti-Submarine Warfare Training Target
EXTORP	Exercise Torpedo
FFWCC	Florida Fish and Wildlife Conservation Commission
FL	Florida
FMC	Fishery Management Council
FMP	Fishery Management Plan
ft	Foot (Feet)
ft^2	Square Foot (Feet)
GDAIS	General Dynamics Advanced Information System
GIS	Geographic Information System
GMFMC	Gulf of Mexico Fishery Management Council
HAPC	Habitat Area(s) of Particular Concern
HCN	Hydrogen Cyanide
HMS	Highly Migratory Species
IFH	Improved Flex Hose
in	Inch(es)
in^2	Square Inch(es)
JAX	Jacksonville
kg	Kilogram(s)
km	Kilometer(s)
km^2	Square Kilometer(s)
lb(s)	Pound(s)
$LiSO_2$	Lithium Sulfur Dioxide
m	Meter(s)
m^2	Square Meter(s)
MAB	Mid-Atlantic Bight
MAFMC	Mid-Atlantic Fishery Management Council
MDNR	Maryland Department of Natural Resources
mg/L	Milligram(s) per Liter
MSFCMA	Magnuson-Stevens Fishery Conservation and Management Act

LIST OF ACRONYMS AND ABBREVIATIONS (cont.)

MU	Management Unit
NAVO	Naval Oceanographic Office
NC	North Carolina
NCDMF	North Carolina Division of Marine Fisheries
NEFMC	New England Fishery Management Council
NM	Nautical Mile(s)
NM^2	Square Nautical Mile(s)
NMFS	National Marine Fisheries Service
NOAA	National Oceanic and Atmospheric Association
OFM	Office of Fisheries Management
OPAREA	Operating Area
ppm	Parts per Million
ppb	Parts per Billion
psu	Practical Salinity Unit(s)
REXTORP	Recoverable Exercise Torpedo
SAB	South Atlantic Bight
SAFMC	South Atlantic Fishery Management Council
SAV	Submerged Aquatic Vegetation
SCDNR	South Carolina Department of Natural Resources
SCMRD	South Carolina Marine Resources Division
SEAMAP	Spatial Ecological Analysis of Megavertebrate Populations
SFA	Sustainable Fisheries Act
SFH	Strong Flex Hose
U.S.	United States
U.S.C.	United States Code
USEPA	United States Environmental Protection Agency
USGS	United States Geological Survey
USWTR	Undersea Warfare Training Range
VACAPES	Virginia Capes
VLA	Vertical Launch Antisubmarine
VMRC	Virginia Marine Resources Commission
XBT	Expendable Bathythermograph

1.0 ESSENTIAL FISH HABITAT

In 1996, the Magnuson Fishery Conservation and Management Act was reauthorized and amended as the Magnuson-Stevens Fishery Conservation and Management Act (MSFCMA), which is known popularly as the Sustainable Fisheries Act (SFA). The MSFCMA mandated numerous changes to the existing legislation designed to prevent overfishing, rebuild depleted fish stocks, minimize bycatch, enhance research, improve monitoring, and protect fish habitat. One of the most significant mandates in the MSFCMA is the essential fish habitat (EFH) provision, which provides the means by which to conserve fish habitat.

The EFH mandate requires that the regional fishery management councils (FMCs), through federal fishery management plans (FMPs), describe and identify EFH for each federally managed species; minimize, to the extent practicable, adverse effects on such habitat caused by fishing; and identify other actions to encourage the conservation and enhancement of such habitats. Congress defines EFH as "those waters and substrate necessary to fish for spawning, breeding, feeding, or growth to maturity" (16 United States Code [U.S.C.] 1802[10]). The term "fish" is defined in the MSFCMA as "finfish, mollusks, crustaceans, and all other forms of marine animals and plant life other than marine mammals and birds." The regulations for implementing EFH clarify that "waters" include all aquatic areas and their biological, chemical, and physical properties, while "substrate" includes the associated biological communities that make these areas suitable fish habitats (Code of Federal Regulations [CFR] 50:600.10). Habitats used at any time during a species' life cycle (i.e., during at least one of its lifestages) must be accounted for when describing and identifying EFH (NMFS 2002a).

Authority to implement the MSFCMA is given to the Secretary of Commerce through the National Marine Fisheries Service (NMFS). The MSFCMA requires that EFH be identified and described for each federally managed species. The MSFCMA also requires federal agencies to consult with the NMFS on activities that may adversely affect EFH or when the NMFS independently learns of a federal activity that may adversely affect EFH. The MSFCMA defines an adverse effect as "any impact which reduces quality and/or quantity of EFH [and] may include direct (e.g., contamination or physical disruption), indirect (e.g., loss of prey, reduction in species' fecundity), site-specific or habitat wide impacts, including individual, cumulative, or synergistic consequences of actions" (50 CFR 600.810).

In addition to EFH designations, areas called habitat areas of particular concern (HAPC) are designated to provide additional focus for conservation efforts and represent a subset of designated EFH that are especially important ecologically to a species/lifestage and/or are vulnerable to degradation (50 CFR 600.805-600.815). Categorization as HAPC does not confer additional protection or restriction to the designated area.

Species within the federal waters of the four proposed Undersea Warfare Training Range (USWTR) sites fall primarily under the jurisdiction of three FMCs and one federal agency: the South Atlantic Fishery Management Council (SAFMC; jurisdiction is federal waters from North Carolina to eastern Florida at Key West), the Mid-Atlantic Fishery Management Council (MAFMC; jurisdiction is federal waters from New York to North Carolina), the New England Fishery Management Council (NEFMC; jurisdiction is federal waters from Maine to Connecticut), and the NMFS (jurisdiction limited to highly migratory species [HMS] in federal waters off the U.S. Atlantic and the Gulf of Mexico), respectively. The SAFMC manages a total of 88 species of fishes and invertebrates (not including the ~118 species of corals and the two species of *Sargassum*), the MAFMC manages 12 species, the NEFMC manages 26 species, and the NMFS manages 49 HMS species through the Consolidated Atlantic Highly Migratory Species FMP. Additionally, many species are co-managed by more than one FMC and/or commission (Table 1-1). The SAFMC and the Gulf of Mexico Fishery Management Council (GMFMC) co-manage two management units (MUs): the spiny lobster MU and the coastal migratory pelagics MU. The SAFMC co-manages the red drum MU with the Atlantic States

Table 1-1. Management units (MU) and managed species with designated EFH and HAPC within the proposed USWTR at sites of Jacksonville (Site A), Charleston (B), Cherry Point (C), and VACAPES (D) by management agency and lifestage (E=egg, L=larva, J=juvenile, A=adult, S=spawning adult, N=neonate, All= all lifestages or Sites).

Species	Lifestage(s) with EFH Designated by Site			
	Site A	Site B	Site C	Site D
New England Fishery Management Council				
Atlantic Herring MU				
Atlantic herring (*Clupea harengus*)	-----	-----	-----	J, A
Atlantic Sea Scallop MU				
Sea scallop (*Placopecten magellanicus*)	-----	-----	-----	All
Deep-Sea Red Crab MU				
Deep-sea red crab (*Geryon quinquedens*)	-----	-----	-----	All
Northeast Multispecies MU				
Large Mesh				
Haddock (*Melanogrammus aeglefinus)*	-----	-----	-----	L
Windowpane flounder (*Scophthalmus aquosus)*	-----	-----	-----	All
Witch flounder (*Glyptocephalus cynoglossus)*	-----	-----	-----	E, L, J
Yellowtail flounder (*Limanda ferruginea)*	-----	-----	-----	All
Small Mesh				
Offshore hake (*Merluccius albidus)*	-----	-----	-----	All
Red hake (*Urophycis chuss)*	-----	-----	-----	All
Silver hake/whiting (*Merluccius bilinearis)*	-----	-----	-----	All
Northeast Skate Complex MU				
Clearnose skate (*Raja eglanteria)*	-----	-----	-----	J, A
Little skate (*Leucoraja erinacea)*	-----	-----	-----	All
Rosette skate (*Leucoraja garmani virginica)*	-----	-----	-----	J
Winter skate (*Leucoraja ocellata)*	-----	-----	-----	J
Monkfish MU[1]				
Goosefish/monkfish (*Lophius americanus*)	-----	-----	-----	All
Mid-Atlantic Fishery Management Council				
Atlantic Mackerel, Squid, and Butterfish MU				
Atlantic mackerel (*Scomber scombrus)*	-----	-----	-----	L, J, A
Butterfish (*Peprilus triacanthus)*	-----	-----	-----	All
Longfin inshore squid (*Loligo pealeii)*	-----	-----	-----	J, A
Northern shortfin squid (*Illex illecebrosus)*	-----	-----	-----	J, A
Bluefish MU[2]				
Bluefish (*Pomatomus saltatrix)*	All	All	All	All
Spiny Dogfish MU[3]				
Spiny dogfish (*Squalus acanthias)*	J, A	J, A	J, A	J, A
Summer Flounder, Scup, and Black Sea Bass MU[2]				
Black sea bass (*Centropristis striata)*	All	All	All	L, J, A
Scup (*Stenotomus chrysops)*	-----	-----	-----	J, A
Summer flounder (*Paralichthys denootatus)*	All	All	All	All
Surfclam and Ocean Quahog MU				
Atlantic surfclam (*Spisula solidissima)*	-----	-----	-----	J, A
Ocean quahog (*Arctica islandica)*	-----	-----	-----	J, A
Tilefish MU				
Tilefish (*Lopholatilus chamaeleonticeps)*	All	All	All	All

Table 1-1. Management units (MU) and managed species with EFH and HAPC designated within the proposed USWTR sites of Jacksonville (Site A), Charleston (B), Cherry Point (C), and VACAPES (D) by management agency and lifestage (E=egg, L=larva, J=juvenile, A=adult, S=spawning adult, N=neonate, All= all lifestages) (cont.).

Species	Lifestage(s) with EFH Designated by Site			
	Site A	Site B	Site C	Site D
South Atlantic Fishery Management Council				
Calico Scallop MU				
Atlantic calico scallop (*Agopecten gibbus)*	All	All	All	-----
Coastal Migratory Pelagics MU[4]				
Cobia (*Rachycentron canadum)*	All	All	All	-----
King mackerel (*Scomberomorus cavalla)*	All	All	All	All
Spanish mackerel (*Scomberomorus maculates)*	All	All	All	All
Coral, Coral Reefs, and Live Bottom Habitats MU				
Corals (Black corals and octocorals)	All	All	All	-----
Dolphin and Wahoo MU				
Dolphin (*Coryphaena hippurus)*	All	All	All	-----
Pompano dolphin (*Coryphaena equiselis)*	All	All	All	-----
Wahoo (*Acanthocybium solandri)*	All	All	All	-----
Golden Crab MU				
Golden deepsea crab (*Chaceon fenneri)*	All	All	All	-----
Red Drum MU[5]				
Red drum (*Sciaenops ocellatus)*	A	A	A	A
Sargassum MU				
Sargassum natans	All	All	All	All
Sargassum fluitans	All	All	All	All
Shrimp MU				
Brown shrimp (*Farfantepenaeus aztecus)*	All	All	All	-----
Pink shrimp (*Farfantepenaeus duorarum)*	All	All	All	-----
Rock shrimp (*Sicyonia brevirostris*)	All	All	All	-----
Royal red shrimp (*Pleoticus robustus*)	All	All	All	-----
White shrimp (*Litopenaeus setiferus)*	All	All	All	-----
Snapper-Grouper MU				
Almaco jack (*Seriola rivoliana*)	All	All	All	-----
Atlantic spadefish (*Chaetodipterus faber*)	All	All	All	-----
Banded rudderfish (*Seriola zonata*)	All	All	All	-----
Bank sea bass (*Centropristis ocyurus*)	All	All	All	-----
Bar jack (*Carangoides ruber*)	All	All	All	-----
Black grouper (*Mycteroperca bonaci*)	All	All	All	-----
Black margate (*Anisotremus surinamensis*)	All	All	All	-----
Black sea bass (*Centropristis striata*)	All	All	All	L, J, A
Black snapper (*Apsilus dentatus*)	All	All	All	-----
Blackfin snapper (*Lutjanus buccanella*)	All	All	All	-----
Blue runner (*Caranx crysos*)	All	All	All	-----
Blueline tilefish (*Caulolatilus microps*)	All	All	All	-----
Bluestriped grunt (*Haemulon sciurus*)	All	All	All	-----
Coney (*Cephalopholis fulva*)	All	All	All	-----
Cottonwick (*Haemulon melanurum*)	All	All	All	-----

Table 1-1. Management units (MU) and managed species with EFH and HAPC designated within the proposed USWTR sites of Jacksonville (Site A), Charleston (B), Cherry Point (C), and VACAPES (D) by management agency and lifestage (E=egg, L=larva, J=juvenile, A=adult, S=spawning adult, N=neonate, All= all lifestages) (cont.).

Species	Lifestage(s) with EFH Designated by Site			
	Site A	Site B	Site C	Site D
South Atlantic Fishery Management Council (cont.)				
Snapper-Grouper MU (cont.)				
Cottonwick (*Haemulon melanurum*)	All	All	All	-----
Crevalle jack (*Caranx hippos*)	All	All	All	-----
Cubera snapper (*Lutjanus cyanopterus*)	All	All	All	-----
Dog snapper (*Lutjanus jocu*)	All	All	All	-----
French grunt (*Haemulon flavolineatum*)	All	All	All	-----
Gag (*Mycteroperca microlepis*)	All	All	All	-----
Goliath grouper (*Epinephelus itajara*)	All	All	All	-----
Grass porgy (*Calamus arctifrons*)	All	All	All	-----
Gray snapper (*Lutjanus griseus*)	All	All	All	-----
Gray triggerfish (*Balistes capriscus*)	All	All	All	-----
Graysby (*Cephalopholis cruentata*)	All	All	All	-----
Greater amberjack (*Seriola dumerili*)	All	All	All	-----
Hogfish (*Lachnolaimus maximus*)	All	All	All	-----
Jolthead porgy (*Calamus bajonado*)	All	All	All	-----
Knobbed porgy (*Calamus nodosus*)	All	All	All	-----
Lane snapper (*Lutjanus synagris*)	All	All	All	-----
Lesser amberjack (*Seriola fasciata*)	All	All	All	-----
Longspine porgy (*Stenotomus caprinus*)	All	All	All	-----
Mahogany snapper (*Lutjanus mahogoni*)	All	All	All	-----
Margate (*Haemulon album*)	All	All	All	-----
Misty grouper (*Epinephelus mystacinus*)	All	All	All	-----
Mutton snapper (*Lutjanus analis*)	All	All	All	-----
Nassau grouper (*Epinephelus striatus*)	All	All	All	-----
Ocean triggerfish (*Canthidermis sufflamen*)	All	All	All	-----
Porkfish (*Anisotremus virginicus*)	All	All	All	-----
Puddingwife (*Halichoeres radiatus*)	All	All	All	-----
Queen snapper (*Etelis oculatus*)	All	All	All	-----
Queen triggerfish (*Balistes vetula*)	All	All	All	-----
Red grouper (*Epinephelus morio*)	All	All	All	-----
Red hind (*Epinephelus guttatus*)	All	All	All	-----
Red porgy (*Pagrus pagrus*)	All	All	All	-----
Red snapper (*Lutjanus campechanus*)	All	All	All	-----
Rock hind (*Epinephelus adscensionis*)	All	All	All	-----
Rock sea bass (*Centropristis philadelphica*)	All	All	All	-----
Sailors choice (*Haemulon parra*)	All	All	All	-----
Sand tilefish (*Malacanthus plumieri*)	All	All	All	-----
Saucereye porgy (*Calamus calamus*)	All	All	All	-----
Scamp (*Mycteroperca phenax*)	All	All	All	-----
Schoolmaster (*Lutjanus apodus*)	All	All	All	-----
Scup (*Stenotomus chrysops*)	All	All	All	-----
Sheepshead (*Archosargus probatocephalus*)	All	All	All	-----

Table 1-1. Management units (MU) and managed species with EFH and HAPC designated within the proposed USWTR sites of Jacksonville (Site A), Charleston (B), Cherry Point (C), and VACAPES (D) by management agency and lifestage (E=egg, L=larva, J=juvenile, A=adult, S=spawning adult, N=neonate, All= all lifestages) (cont.).

Species	Lifestage(s) with EFH Designated by Site			
	Site A	Site B	Site C	Site D
South Atlantic Fishery Management Council (cont.)				
Snapper-Grouper MU (cont.)				
Silk snapper (*Lutjanus vivanus*)	All	All	All	-----
Smallmouth grunt (*Haemulon chrysargyreum*)	All	All	All	-----
Snowy grouper (*Epinephelus niveatus*)	All	All	All	-----
Spanish grunt (*Haemulon macrostomum*)	All	All	All	-----
Speckled hind (*Epinephelus drummondhayi*)	All	All	All	-----
Tiger grouper (*Mycteroperca tigris*)	All	All	All	-----
Tilefish (*Lopholatilus chamaeleonticeps*)	All	All	All	All
Tomtate (*Haemulon aurolineatum)*	All	All	All	-----
Vermillion snapper (*Rhomboplites aurorubens*)	All	All	All	-----
Warsaw grouper (*Epinephelus nigritus*)	All	All	All	-----
White grunt (*Haemulon plumieri*)	All	All	All	-----
Whitebone porgy (*Calamus leucosteus*)	All	All	All	-----
Wreckfish (*Polyprion americanus*)	All	All	All	-----
Yellow jack (*Carangoides bartholomaei*)	All	All	All	-----
Yellowedge grouper (*Epinephelus flavolimbatus*)	All	All	All	-----
Yellowfin grouper (*Mycteroperca venenosa*)	All	All	All	-----
Yellowmouth grouper (*Mycteroperca interstitialis*)	All	All	All	-----
Spiny Lobster MU[4]				
Caribbean spiny lobster (*Panulirus argus)*	All	All	All	-----
Ridged slipper lobster (*Scyllarides notifer*)	All	All	All	-----
National Marine Fisheries Service				
Tuna MU				
Albacore tuna (*Thunnus alalunga)*	-----	-----	-----	J, A
Bigeye tuna (*Thunnus obesus)*	-----	-----	-----	J, A
Bluefin tuna (*Thunnus thynnus)*	E, L, S	E, L, S	-----	J, A
Skipjack tuna (*Katsuwonus pelamis)*	-----	-----	-----	A
Yellowfin tuna (*Thunnus albacares)*	-----	J, A	J, A	J, A
Billfish MU				
Blue marlin (*Makaira nigricans)*	-----	J, A	J, A	J, A
Sailfish (*Istiophorus platypterus)*	J, A	J, A	A	-----
White marlin (*Tetrapturus albidus)*	J	J, A	J, A	J, A
Swordfish MU				
Swordfish (*Xiphias gladius)*	E, L, A, S	All	All	J, A
Large Coastal Sharks MU				
Blacktip shark (*Carcharhinus limbatus)*	All	N, J	N, J	-----
Bull shark (*Carcharhinus leucas)*	J	-----	-----	-----
Lemon shark (*Negaprion brevirostris)*	All	J	-----	-----
Nurse shark (*Ginglymostomatidae cirratum)*	J, A	-----	-----	-----
Sandbar shark (*Carcharhinus plumbeus)*	All	All	All	All
Scalloped hammerhead shark (*Sphyrna lewini)*	All	All	A, J	A, J

Table 1-1. Management units (MU) and managed species with EFH and HAPC designated within the proposed USWTR sites of Jacksonville (Site A), Charleston (B), Cherry Point (C), and VACAPES (D) by management agency and lifestage (E=egg, L=larva, J=juvenile, A=adult, S=spawning adult, N=neonate, All= all lifestages) (cont.).

Species	Lifestage(s) with EFH Designated by Site			
	Site A	Site B	Site C	Site D
National Marine Fisheries Service (cont.)				
Large Coastal Sharks MU (cont.)				
Silky shark (*Carcharhinus falciformis)*	J	N, J	N, J	-----
Spinner shark (*Carcharhinus brevipinna)*	N, J	N	N	-----
Tiger shark (*Galeocerdo cuvier)*	All	All	All	N, J
Small Coastal Sharks MU				
Atlantic sharpnose shark (*Rhizopriondon terraenovae)*	All	N, J	All	A
Blacknose shark (*Carcharhinus acronotus)*	N, J	N	-----	-----
Bonnethead (*Sphyrna tiburo)*	All	N, J	-----	-----
Finetooth shark (*Carcharhinus isodon)*	All	All	A, J	-----
Pelagic Sharks MU				
Blue shark (*Prionace glauca)*	-----	-----	-----	J, A
Oceanic whitetip shark (*Carcharhinus longimanus)*	J, A	All	A	-----
Shortfin mako shark (*Isurus oxyrinchus*)	-----	-----	-----	All
Prohibited Species MU				
Basking shark (*Cetorhinus maximus)*	-----	-----	-----	J
Bignose shark (*Carcharhinus altimus)*	-----	N, J	N, J	N, J
Dusky shark (*Carcharhinus obscurus)*	All	J, A	All	N, J
Longfin mako shark (*Isurus paucus)*	All	All	All	All
Night shark (*Carcharhinus signatus)*	A	A	J, A	J
Sand tiger shark (*Carcharius taurus)*	N	N	N	N, A

[1] Jointly managed by the NEFMC (lead) and the MAFMC
[2] Jointly managed by the MAFMC and the ASMFC
[3] Jointly managed by the MAFMC (lead), the NEFMC, and ASMFC
[4] Jointly managed by the SAFMC (lead) and the GMFMC
[5] Jointly managed by the SAFMC and the ASMFC

Marine Fisheries Commission (ASMFC). The MAFMC jointly manages the bluefish MU and the summer flounder, scup, and black sea bass MU with the ASMFC. The MAFMC also co-manages the monkfish MU with the NEFMC, which serves as the lead on the monkfish MU. In addition, the MAFMC is the lead agency on the spiny dogfish MU, which it co-manages with the NEFMC and ASMFC. In addition to designating EFH and HAPC, the FMCs and the NMFS manage the commercial and recreational fisheries in federal waters.

The FMCs and the NMFS designate EFH and HAPC by species or MU. While EFH in the proposed action areas will be described by habitat type (e.g., hard bottom, pelagic *Sargassum*), as this method is most useful when determining and describing potential impacts on EFH and HAPC, it is also vital to have information about each species or MU for which EFH has been designated with the Navy's four southeast operating areas (OPAREAs). Basic information about the species managed in each MU, generalized EFH summaries, as well as brief life history information is presented in the following.

1.1 MU and Managed Species with EFH in the Action Areas

- **Atlantic Herring MU** – This MU consists of one species, the Atlantic herring. Atlantic herring are a pelagic schooling species occurring at various water depths depending on lifestage, season, and geographic location. Eggs of Atlantic herring are demersal, adhesive, and deposited on a variety of benthic habitats including boulders, rocks, gravel, shell fragments, and macrophytes. Herring larvae are pelagic and can remain at spawning sites for months or can be dispersed by local currents (NEFMC 1998; Munroe 2002). EFH is designated for all lifestages, including spawning adult, of this species. Designated EFH generally extends from the Gulf of Maine to the Mid-Atlantic Bight (MAB) and below Chesapeake Bay (NEFMC 1998). EFH for this species/MU is designated only in the Virginia Capes (VACAPES) OPAREA.

- **Atlantic Sea Scallop MU** – The Atlantic sea scallop is the only managed species in this MU. Atlantic sea scallops typically occur in dense benthic aggregations called beds (Packer et al. 1999). The highest concentration of sea scallop beds corresponds to regions where suitable temperatures, food availability, substrate, and physical oceanographic features (e.g., ocean fronts, currents, and gyres) are found (Packer et al. 1999). Eggs are demersal and remain on the seafloor until they develop into free-swimming larvae. Juveniles and adults attach themselves to shells, gravel, and other bottom debris (Hart and Chute 2004). EFH is designated for all lifestages of the Atlantic sea scallop, including spawning adults; the extent of the designated EFH, principally benthic habitats, is from the Gulf of Maine to the Virginia/North Carolina border (NEFMC 1998). EFH for all lifestages of the sea scallop may be found in the VACAPES OPAREA.

- **Deep-Sea Red Crab MU** – This MU consists of the single crab species. The deep-sea red crab broods its eggs attached to the underside of the female's body until the eggs hatch and are released into the water column. Deep-sea red crab larvae are pelagic (NEFMC 2002), and both juveniles as well as adults associate with a range of hard and soft substrates, including silt and clay (Steimle et al. 2001). EFH, designated for all life stages of the deep-sea red crab (Appendix A), primarily includes benthic habitats but the entire water column is included for larvae from George's Bank to just south of Cape Hatteras, NC (NEFMC 1998). EFH for this MU occurs primarily in the VACAPES OPAREA.

- **Northeast Multispecies MU** – This MU includes 15 temperate fish species, 12 from the groundfish multispecies MU and three additional species classified as small mesh multispecies. The fish species in this MU are grouped together as they are frequently caught by the same fishing vessels and fishing gear (bottom trawls). In the VACAPES OPAREA, five of the MU species have EFH designated for all lifestages while two species have EFH designated only for one or more lifestages (Table 1-1). EFH for these species has generally been designated from the Gulf of Maine and Georges Bank to the MAB (NEFMC 1998).

- **Northeast Skate MU** – Seven skate species are included in this MU, of which four, the clearnose, little, rosette, and winter skates, have EFH for at least one or more lifestages designated primarily in the VACAPES OPAREA. These temperate species occupy bottom habitats as juveniles and adults and all species lay eggs enclosed in a leathery case referred to as a "mermaid's purse". There is no larval stage and when the juveniles hatch from the egg case, they are in adult form (NEFMC 2003a).

- **Monkfish MU** – The monkfish or goosefish, the only species included in this MU, release their eggs in long mucous egg veils that float at the surface and are subject to the actions of the currents, wind, and waves (Wood 1982; Steimle et al. 1999; Caruso 2002). Eggs occur both inshore and offshore on the continental shelf (Wood 1982; Steimle et al. 1999). Larval goosefish are pelagic and occur across the continental shelf (Steimle et al. 1999). Upon transition into juveniles, goosefish begin a benthic existence. Adult goosefish prefer habitats of hard sand, gravel and broken shells, pebbly bottoms, and soft mud (Almeida et al. 1995; Caruso 2002). Designated EFH for all lifestages of the monkfish ranges from the Gulf of Maine to Cape Hatteras, NC, primarily in the VACAPES OPAREA.

- **Atlantic Mackerel, Squid, and Butterfish MU** – Four species of fishes and invertebrates, including two species of squid, are encompassed in this MU. All are temperate species with EFH for all lifestages designated generally as pelagic waters from the Gulf of Maine south through the MAB (MAFMC 2006). Designated EFH for all four MU species is found within the VACAPES OPAREA (**Table 1-1**).

- **Bluefish MU** – The bluefish is a warm-water pelagic species that rarely uses both offshore and inshore habitats (Klein-MacPhee 2002a). Bluefish eggs and larvae are pelagic (MAFMC and ASMFC 1998a). Larvae are transported from spawning grounds in the South Atlantic Bight (SAB) to estuaries via the Gulf Stream (Hare and Cowen 1996). EFH is designated as the continental shelf and inshore pelagic waters for all lifestages of this species in all four action areas: VACAPES, Cherry Point (CHPT), Charleston (CHASN), and Jacksonville (JAX) OPAREAs (MAFMC and ASMFC 1998a).
- **Spiny Dogfish MU** – Spiny dogfish are ovoviviparous, with eggs developing internally (Burgess 2002). The offspring, known as pups, are born live as fully developed juveniles following a gestation period of two years (Cohen 1982). Both juvenile and adult spiny dogfish are epibenthic but move throughout the water column. They inhabit nearshore shallow waters out to the continental shelf (Burgess 2002). EFH for this species is designated for juveniles and adults as continental shelf waters from the Gulf of Maine to Cape Canaveral, FL, encompassing all four action areas.
- **Summer Flounder, Scup, and Black Sea Bass MU** – Three temperate fish species, all demersal as juveniles and adults, are included in this MU. EFH designated for most lifestages of all three species in this MU includes the pelagic and demersal waters from the Gulf of Maine through the MAB (MAFMC and ASMFC 1998b). Scup occur more northerly and have EFH designated in the VACAPES OPAREA, while the summer flounder's EFH extends to Cape Canaveral, FL and encompasses all four action areas (MAFMC and ASMFC 1998b). The black sea bass is managed in the northern extent of its range as part of this MU. However, south of Cape Hatteras, NC, the species is managed by the SAFMC (1998) as part of the Snapper-Grouper MU. The black sea bass favors structured habitats such as reefs and wrecks, but all of the three species make seasonal migrations (Klein-McPhee 2002b).
- **Surfclam and Ocean Quahog MU** – The two clam species included in this MU occur in sandy substrate on the continental shelf, which is designated as EFH for the juvenile and adult lifestages (MAFMC 1998). Designated EFH for both lifestages of the Atlantic surfclam and ocean quahog is found in the VACAPES OPAREA while the surfclam's EFH extends just into the most northern corner of the CHPT OPAREA. The ocean quahog is the more northerly occurring species, with EFH extending from the Gulf of Maine to roughly the Virginia/North Carolina border while the Atlantic surfclam's EFH extends further south to north of Cape Hatteras, NC (MAFMC 1998).
- **Tilefish MU** – The tilefish is managed as a single species MU by the MAFMC (2000) but this species is also one of the species included in the Snapper-Grouper MU, which is managed by the SAFMC (1998). Eggs and larvae of tilefish are planktonic while juveniles and adults inhabit burrows or some other type of shelter, sometimes in waters as deep as 800 m (2,625 ft) (Able et al. 1982). EFH has been designated for all lifestages by both the MAFMC as part of the MU and the SAFMC as part of the Snapper-Grouper MU. The MAFMC (2000) designates EFH for all lifestages of this species as the water column from the Canadian/U.S. to the Virginia/North Carolina borders. HAPC have been designated for all lifestages of the tilefish by the MAFMC (2000) and the SAFMC (1998). In general, EFH for all lifestages of the tilefish occurs in the VACAPES, CHPT, CHASN, and JAX OPAREAs, and designated HAPC are also found within all four OPAREAs.
- **Calico Scallop MU –** Larval Atlantic calico scallops, the sole member of this MU, are initially pelagic and planktonic but settle as spat. Spat primarily attach to shells of dead or living mollusks but also objects such as navigation buoys and other floating objects (SAFMC 1998). Upon reaching 2.5 centimeters (cm) (0.98 inches [in]), Atlantic calico scallops detach and are capable of swimming (SAFMC 1998). Larger, unattached Atlantic calico scallops prefer substrates of hard sand, sand and shell, quartz sand, smooth sand-shell-gravel, and sand and empty shells (SAFMC 1998). EFH

includes the Gulf Stream Current (larvae) and unconsolidated sediments from Virginia/North Carolina to the Florida Keys for all lifestages of this species (SAFMC 1998). EFH is expected for this species in all four OPAREAs.

- **Coastal Migratory Pelagics MU** – This MU consists of five fish species, Spanish mackerel, king mackerel, cobia, cero mackerel, and little tunny. Adult habitat of this group typically consists of waters from the coast to the continental shelf, at depths of less than 80 meters (m), temperatures above 20°C, and high salinities (e.g., from 32 to 36 [practical salinity units] psu for mackerels and 24 to 36 psu for cobia) (GMFMC 1998). Adults often associate with pelagic *Sargassum* or other floating objects and structure such as shipwrecks and reefs (GMFMC 1998; Bester 1999). Juveniles are primarily found offshore but sometimes use estuaries, while eggs and larvae are pelagic (GMFMC 1998). Of the five species in the MU, only king mackerel, Spanish mackerel, and cobia have designated EFH. These EFH are designated for all lifestages in all four action areas (VACAPES, CHPT, CHASN, and JAX OPAREAs) as bottom substrate in inshore and inner continental shelf waters of the MAB and SAB and as the Gulf Stream for larvae (SAFMC 1998). HAPC have also been designated in the VACAPES, CHPT, CHASN, and JAX OPAREAs.
- **Coral, Coral Reefs, and Live Bottom Habitat MU** – Accounting for more than 300 species, this MU consists of coral species (hydrocorals, fire corals, stony corals, octocorals, and black coral), coral reefs, and live/hard bottom habitat (SAFMC 1998). Corals exist in oceanic habitats ranging from the nearshore to the continental slopes and canyons, including intermediate shelf zones. Corals may be the primary component of a habitat (e.g., coral reefs), contribute to a habitat (e.g., live/hard bottom communities), or exist as individuals within a community characterized by other fauna (e.g., solitary corals) (SAFMC 1998). Distribution of corals is contingent on a variety of environmental parameters. Latitude-correlated environmental parameters include temperature, light, substrate, and currents. Non-latitude-correlated or regional environmental factors that affect coral growth include surface water circulation, substrate availability, sedimentary regimes, tidal regimes, and nutrients. EFH for this large MU is differentiated by taxa and generally consists of varying types of benthic substrate with varying temperature and salinity parameters specific to each of the groups (SAFMC 1998). HAPC for all coral species and lifestages is designated at specific locations in the SAB (SAFMC 1998). EFH for the stony corals and octocorals also occurs in the lower part of the VACAPES OPAREA and throughout much of the shelf waters of the CHPT, CHASN, and JAX OPAREAs. HAPC are found in all four OPAREAs.
- **Dolphin and Wahoo MU** – Three fish species, including two species of dolphinfish (common and pompano dolphinfishes) and the wahoo comprise this MU. These oceanic pelagic fishes occur principally in subtropical to tropical waters but have been observed as far north as the Canadian Maritimes (Manooch 1988). Juvenile and adult dolphinfish and adult wahoo associate with pelagic *Sargassum* mats.. Adult dolphinfish are epipelagic but adult wahoos are generally confined to waters with temperatures ranging from 22° to 28°C (SAFMC 2003a). EFH for all lifestages of species in this MU includes *Sargassum*, the Gulf Stream and Florida Currents, and the Charleston Gyre (SAFMC 2003a). HAPC have also been designated for specific bathymetric features throughout the SAB for all lifestages of this MU (SAFMC 2003a). EFH and HAPC are located in all four action areas (VACAPES, CHPT, CHASN, and JAX OPAREAs).
- **Golden Crab MU** – The golden deep-sea crab is typically found in highest abundance in the tropical to sub-tropical waters of the SAB at depths of 367 to 549 m (1,204 to 1,801 ft). The occurrence and abundance of this species is primarily driven by sediment type, with the largest catches occurring over substrates composed of a mixture of silt-clay and foraminiferans (Wenner et al. 1987). Wenner and Barans (1990) identified seven habitats on the continental slope inhabited by the golden deep-sea crab, the principal of which is the ooze-covered bottom characterized by foraminifera and pteropod debris at depths of 405 to 567 m (1,328 to 1,860 ft). The SAFMC (1998) based its EFH designations for all lifestages on the seven habitats identified by Wenner and Barans (1990) but used additional

survey data to expand the depth ranges of the habitats so that the continental slope from the Chesapeake Bay to the Florida Straits is considered EFH for this species. EFH may be found in all four OPAREAs.

- **Shrimp MU** – The shrimp MU consists of five species, three penaeid shrimp (brown, pink, and white) as well as two deepwater shrimp species (brown rock and royal red). Penaeid eggs are demersal, and the larvae are pelagic (GMFMC 2004). Estuaries provide important nursery and adult habitats for penaeid shrimp (GMFMC 2004). Adult penaeid shrimp also use offshore habitats, where they are associated with soft substrates (Muncy 1984; Pattillo et al. 1997). Little is known about the habitat preferences of the deepwater royal red shrimp, especially the early lifestages (SAFMC 1998; GMFMC 2004). Unlike the penaeid shrimp, the royal red shrimp is not estuarine-dependent for any part of its life cycle and is most abundant over soft substrates consisting primarily of mud (Anderson and Linder 1971; SAFMC 1993, 1998; GMFMC 1998, 2004). Brown rock shrimp occur mainly on soft substrate in water depths up to 180 m (590 ft) (SAFMC 1998). In general, EFH is designated as varied inshore, pelagic, and benthic habitats from the Virginia/North Carolina border to southern Florida. Designated EFH is found in all four OPAREAs for at least two lifestages of each shrimp species.
- **Snapper-Grouper MU** – Seventy-three species comprise this large MU and have designated EFH in the action areas (SAFMC 1998, 2003b). Even though there is much variation in habitat use by the many and varied species in the Snapper-Grouper MU, generalities exist. Eggs and larvae are pelagic (SAFMC 2003b).The juveniles and adults are demersal and typically associate with artificial and natural reefs, ledges, caves, outcropping, and hard bottom habitat (SAFMC 1983; GMFMC 1989). Some species also use seagrass beds and other estuarine habitats (GMFMC 2004). Juvenile jack species often associate with floating objects, such as pelagic *Sargassum*, and debris (GMFMC 2004). Tilefish are typically associated with deeper waters (over 91 m depth) off the continental shelf and upper slope (SAFMC 1983, 2003b). Both deepwater species (lower continental shelf waters; e.g., red snapper, blackfin snapper, vermilion snapper, yellowedge grouper, goliath grouper, Warsaw grouper, and Nassau grouper) and shallow-water species (shelf edge; e.g., yellowtail snapper, mutton snapper, and gray snapper) are found in the action areas (SAFMC 1983; GMFMC 2004). EFH for all lifestages of species in this MU found in the action areas include pelagic waters, currents (Gulf Stream), and benthic substrate. EFH for all lifestages of the species in this MU are found in each of the four OPAREAs. HAPC have also been designated in all OPAREAs for this MU as pelagic *Sargassum* and specific benthic locations (SAFMC 1998).
- **Spiny Lobster MU** – The generic name "spiny lobster" refers to both species in this MU, the Caribbean spiny and ridged slipper lobsters. After spiny lobster eggs hatch, the larvae are dispersed into offshore waters and remain in the pelagic environment as plankton while developing into post-larvae (Marx and Herrnkind 1986; Appeldoorn et al. 1987). The post-larvae settle to the seafloor in shallow water upon reaching suitable habitat (GMFMC and SAFMC 1982; Marx and Herrnkind 1986; Appeldoorn et al. 1987). Juveniles associate with macroalgae beds and seagrass beds. Upon reaching maturity, adult lobsters move offshore and disperse among the rocks or coral reefs (Marx and Herrnkind 1986). EFH for spiny lobsters is designated for all lifestages and includes the Gulf Stream as well as nearshore and offshore benthic habitats from the North Carolina/Virginia border to the Florida Keys (SAFMC 1998). The EFH range encompasses all four possible action areas (VACAPES, CHPT, CHASN, and JAX OPAREAs).
- **Tuna MU –** Five tuna species comprise this MU, including Atlantic albacore tuna, Atlantic bigeye tuna, Atlantic bluefin tuna, Atlantic skipjack tuna, and Atlantic yellowfin tuna. These species are highly migratory, epipelagic fish that occur primarily in the open ocean and coastal waters (seasonally). Information about the early lifestages of tunas is lacking as eggs and larvae are rarely collected. Adult tuna often associate with oceanographic and physiographic features but also use inshore habitats, especially for seasonal spawning (NMFS 1999b). EFH for the tuna species generally

includes the waters of the continental shelf to deeper oceanic waters of the VACAPES, CHPT, CHASN, and JAX OPAREAs (NMFS 2006).

- **Billfish MU** – Four billfish comprise this MU, which consists of the Atlantic blue marlin, sailfish, white marlin, and spearfish. These species are highly migratory, epipelagic fish that occur primarily in the upper 300 to 600 m (984 to 1,968 ft) of the open ocean and coastal waters (seasonally); billfish are the fastest and among the largest of predatory ocean fishes (NMFS 1999a). Information about the early lifestages of billfish is lacking as eggs and larvae are rarely collected. Adult billfish often associate with oceanographic and physiographic features but also use inshore habitats, especially for seasonal spawning (NMFS 1999a). EFH for the billfish species generally includes the waters from the outer continental shelf to deeper oceanic waters of the VACAPES, CHPT, CHASN, and JAX OPAREAs (NMFS 2006).
- **Swordfish MU –** A single species makes up this MU. Swordfish are epipelagic to mesopelagic, and typically prefer waters warmer than 13°C (NMFS 2006). They typically undergo large migrations and those found in the northwest Atlantic have been found to be diurnal, occupying shallow, near-coastal bottom waters during the day and then moving to offshore surface waters at night. In oceanic waters, swordfish migrated vertically from a depth of 500 m during the day to 90 m at night. EFH typically includes waters from the 100-ft isobath out to the boundary of the EEZ (NMFS 2006).
- **Large Coastal Sharks MU –** There are 11 species of sharks encompassed by this MU, which includes the sandbar, silky, tiger, blacktip, bull, spinner, lemon, nurse smooth hammerhead, scalloped hammerhead, and great hammerhead sharks. All of these species typically inhabitat the continental shelf and display a variety of life histories. Due to the large number of varied species in this MU, it is difficult to synopsize the life history and habitats used by these species except that all are highly migratory (NMFS 2006).
- **Small Coastal Sharks MU** - There are four species of sharks encompassed by this MU, which includes the Atlantic sharpnose, blacknose, finetooth, and bonnethead sharks. All of these species are small in size, generally less than 4 ft, and typically inhabitat the continental shelf. The life history and habitats used by these species vary greatly and, as a result, it is difficult to synopsize them as a group with the exception that all are highly migratory (NMFS 2006).
- **Pelagic Sharks MU –** Five sharks comprise this MU, which consists of the shortfin mako, thresher, oceanic whitetip, porpbeagle, and blue sharks. These species epipelagic fish that occur primarily in the open ocean and coastal waters (NMFS 1999a). The life history and habitats used by these species vary greatly and, as a result, it is difficult to synopsize them as a group with the exception that all are highly migratory (NMFS 2006).
- **Prohibited Sharks MU -** Nineteen species comprise this MU, including the whale, basking, sand tiger, bigeye sand tiger, white, dusky, night, bignose, Galapagos, Caribbean reef, narrowtooth, longfin mako, bigeye thresher, sevengill, sixgill, bigeye sixgill, Caribbean sharpnose, smalltail, and Atlantic angel sharks. All of these species are protected from fishing pressure to their low occurrence, low fecundity, low pup numbers, and high age of maturity. The life history and habitats used by these species vary greatly and, as a result, it is difficult to synopsize them as a group with the exception that all are highly migratory (NMFS 2006).

1.1.1 Types of EFH Designated in the Four Action Areas

EFH designated by the SAFMC can be classified by habitat type into several broad categories which will be used to describe EFH and HAPC designated in the action areas:

- **Benthic Substrates (not including live/hard bottom)** – Seafloor substrate on the continental shelf and slope that consists of soft or unconsolidated sediments such as gravel, cobbles, pebbles, sand, clay, mud, silt, and shell fragments as well as the water-sediment interface directly above the bottom substrate that is used by many invertebrates and demersal fish. These benthic substrate habitats are used by a variety of species for spawning, nesting, development, dispersal, and feeding (SAFMC 1998; NMFS 1999a, 1999b).

- **Live/Hard Bottom** – Areas of the seafloor associated with hard substrate such as rocks, boulders, outcroppings of hard rock, or hard, tightly compacted sediments that support communities of living organisms such as sponges, mussels, hydroids, amphipod tubes, red algae, bryozoans, and corals in oceanic waters or oysters and bivalves in inshore waters (SAFMC 1998). This type of habitat is used by many adult members of the snapper-grouper MU for feeding, shelter, and spawning (NEFMC 1998; SAFMC 1998). The SAFMC (1998) defines hard bottom as constituting "a group of communities characterized by a thin veneer of live corals and other biota overlying assorted sediment types".
- **Artificial Reef** – Human-made structures composed of various types of materials used primarily by the adult lifestages, especially spawning adults (Clark and Livingstone 1982; Steimle and Figley 1996; SAFMC 1998). The SAFMC (1998) defines artificial reefs as any area within marine waters in which suitable structures or materials have intentionally been placed for the purpose of creating, restoring, or improving the long-term habitat for the eventual exploitation, conservation, or preservation of the resulting marine ecosystems that are naturally established on these materials. The SAFMC does not consider shipwrecks as EFH under this definition.
- **Pelagic *Sargassum*** – Mats or aggregations of the pelagic species of the brown algae *Sargassum (Sargassum natans* and *S. fluitans*) provide an important habitat for numerous fishes, especially the larval lifestage (e.g., snapper-grouper MU). Pelagic *Sargassum* aggregations occur principally on the surface of the ocean or in the upper surface layers of the water column. In the North Atlantic Ocean, pelagic *Sargassum* occurs primarily within the physical bounds of the North Atlantic Gyre (or Sargasso Sea) between 20°N and 40°N and between 30°W and the western edge of the Gulf Stream (Dooley 1972; SAFMC 2002). As the areal extent and abundance of *Sargassum* at any single oceanic location is dynamic and totally unpredictable (Butler et al. 1983), the occurrence of pelagic *Sargassum* is mapped from the shoreline to the U.S. EEZ (Ruebsamen 2005).
- **Water Column** – All waters from the surface to the ocean floor (but not including the ocean bottom) comprise the water column. This habitat is important for a wide variety of species and their lifestages (NEFMC 1998; SAFMC 1998; NMFS 1999a).
- **Currents** – Surface circulation features such as the Gulf Stream provide a dispersal mechanism for the larvae of many species (e.g., species in the snapper-grouper complex, coastal migratory pelagic species, dolphin and wahoo, rock and royal red shrimp, and golden crabs) (SAFMC 1998). The Gulf Stream is the dominant surface current in the SAB and flows northward and roughly parallel to the coastline from southern Florida to Cape Hatteras, NC, where it is deflected seaward in a northeasterly direction (Bumpus 1973). Other predominate currents designated as EFH include the Florida Current and the Charleston Gyre.
- **Nearshore –** These habitats are those found in state waters (i.e., from estuaries to 3 nautical miles [NM] from shore) and include a diversity of habitat types, including:
  - Tidal freshwater (palustrine), estuarine, and marine emergent wetlands;
  - Tidal palustrine forested areas;
  - Estuarine scrub/shrub and mangrove habitat;
  - Submerged aquatic vegetation (seagrass, macroalgae, etc.);
  - Subtitdal and intertidal non-vegetated flats;

- Oyster reefs and shell banks;
- Unconsolidated bottoms (soft sediments);
- Tidal freshwater and tidal creeks;
- State-designated nursery habitats; and
- Sandy shoals of capes and offshore bars.

None of these nearshore habitats will be located in any of the range sites and will only be a consideration for the cable corridor.

- **HAPC –** These designations encompass a variety of species and habitats within the vicinity of the proposed USWTR range sites and their respective cable corridors, including:
  - Nearshore (0-4 m) hardbottom areas;
  - Medium to high offshore hard bottom where spawning occurs (snapper-grouper complex);
  - Offshore hard bottom (5-30 m) from Palm Beach County to Fowery Rocks, FL;
  - *Sargassum*;
  - Hermatypic coral habitats and reefs;
  - Manganese outcroppings on the Blake Plateau;
  - Artificial reef special management zones (SMZs);
  - The Point, Ten-Fathom Ledge, and Big Rock (NC);
  - The Charleston Bump, Hurl Rocks, Hoyt Hills, and Georgetown Hole (SC);
  - The Point off Jupiter Inlet, The Hump off Islamorda, The Marathon Hump off of Marathon, and The Wall off the Florida Keys (FL);
  - Oculina banks and *Phragmatopoma* reefs (worm reefs) off central east coast of Florida;
  - Gray's Reef National Marine Sanctuary;
  - Coastal inlets;
  - Barrier islands and the passes between them;
  - SAV and seagrass habitat;
  - Mangrove habitat;
  - Oyster/shell habitat;
  - Sandy shoals of Cape Lookout, Cape Fear, and Cape Hatteras from shore to the ends of the shoals; and
  - State-designated nursery habitats and state-identified overwintering areas.

EFH designations by the NEFMC, the MAFMC, and the NMFS are based largely on the abundance of a species in a given area, usually determined through trawl surveys in the case of the NEFMC and the MAFMC, rather than a preference for a particular type of habitat. These designations make it difficult to assess and quantify potential impacts to the EFH of a given species. In addition, designations by the NEFMC and the MAFMC only apply to the proposed VACAPES range (Site D). To allow for a comparison between each of the four proposed sites, the potential impacts to the habitat categories based on the EFH designations by the SAFMC was assessed at each of the four locations.

To determine how much EFH of each type listed above is found in the prospective range and trunk cable corridor sites, the EFH types and percent area of each type found in the range and corridors was calculated (Table 1-2). With two exceptions, the percent of EFH in the range/corridor is calculated by dividing the estimated surface area of each habitat (e.g., hard bottom) by the estimated surface area of the entire range/corridor. The first exception is for the percent of EFH in the water column, which is based on the estimated volume (as opposed to surface area) of the range/corridor; the percentage is 100% of the volume in all cases. The second exception is for habitat data where no surface area is known (e.g., artificial reefs). These types of habitats represent individual locations or geographic points that may be present in the range and the corridor. For point features, the percent of EFH in the range/corridor is not listed because the surface area associated with each feature is unknown.

To estimate the extent of each habitat type found within the range, the surface area of the range at each of the four proposed sites was calculated by projecting GIS shapefiles representing each site onto a map of the region using the North American Lambert Conformal Conic projection. Discrepancies (< 10%) between the areas calculated using the GIS shapefiles and the extent of the instrumented area stated in Chapter 2 of the USWTR EIS/OEIS of 1,713 square kilometers (km^2) (500 square nautical miles [NM^2]) are most likely attributable to the level of precision in creating the GIS shapefiles, and should not greatly affect the results of the impact analysis. The geographic location of the ranges has not been fixed to allow some flexibility in mitigating potential impacts by moving the range slightly along the shelf.

The linear path in which the trunk cable will be laid has yet to be mapped; the trunk cable will connect the instrumented range to the shore facility. To allow for some deviation in the precise location of the trunk cable pathway and ensure that all EFH potentially impacted by the burial of the trunk cable is considered in the impact analysis, a triangularly shaped corridor was instead defined. The triangular cable corridor was delineated from the two most shoreward corners of each range to the associated shore facility. Within this triangularly shaped corridor, the equipment used to bury the trunk cable will impact a 5 m (16 ft) wide path. As a means of making a more conservative estimate of potential impacts on EFH, the longest distance from the range to the shore facility was chosen as the trunk cable pathway, even though it is more likely that the actual pathway will be shorter and originate closer to the center of the shoreward border of the range.

Point data (e.g., the geographic locations of artificial reefs) represented in this section have no surface area and are therefore not considered in any calculations based on surface area estimations (Table 1-2). Furthermore, the number of point data features visible on maps in this section may not equal the number of point data features stated in the text for a particular habitat (e.g., Site C, Artificial Reef EFH in Figure 1-11 and Table 1-2). This apparent discrepancy is not an error in either the map or the text but occurs when point data features, especially features such as artificial reefs that are located in extremely close proximity to one another, are mapped at a small scale. Point features may often not appear as discrete features unless mapped at a larger scale.

Table 1-2. Total Area (km^2), percentage of known EFH, and number of individual EFH locations by known habitat type for each of the four proposed USWTR sites and corresponding trunk cable corridors.

USWTR Site (OPAREA)	EFH Type	Range Area (km^2)	Area of known EFH Type in Range (km^2)	Percent of Range Designated as EFH Type* (%)	EFH Type Points in Range (#)	Corridor Area (km^2)	Area of known EFH Type in Corridor (km^2)	Percent of Corridor Designated as EFH Type* (%)	EFH Type Points in Corridor (#)
A (Jacksonville)	Benthic Substrates[a]	1,535	935	61	N/A	2,085	1,888	91	0
	Live/Hard Bottom	1,535	600	39	11	2,085	197	9	25
	Artificial Reef	1,535	N/A	N/A	0	2,085	N/A	N/A	106
	Pelagic *Sargassum*	1,535	VAR	VAR	N/A	2,085	VAR	VAR	N/A
	Water Column	1,535	1,535	100	N/A	2,085	2,085	100	N/A
	Currents	1,535	1,535	100	N/A	2,085	1,432	69	N/A
	Nearshore	N/A	N/A	N/A	N/A	2,085	7	0.33	0
	HAPC	1,535	VAR	VAR	146	2,085	VAR	VAR	0
B (Charleston)	Benthic Substrates[a]	1,471	1,285	87	N/A	1,217	947	78	N/A
	Live/Hard Bottom	1,471	186	13	6	1,217	270	22	4
	Artificial Reef	1,471	N/A	N/A	0	1,217	N/A	N/A	12
	Pelagic *Sargassum*	1,471	VAR	VAR	N/A	1,217	VAR	VAR	N/A
	Water Column	1,471	1,471	100	N/A	1,217	1,217	100	N/A
	Currents	1,471	1,471	100	N/A	1,217	898	74	N/A
	Nearshore	N/A	N/A	N/A	N/A	1,217	8	0.69	N/A
	HAPC	1,471	VAR	VAR	79	1,217	VAR	VAR	23
C (Cherry Point)	Benthic Substrates[a]	1,639	1,534	94	N/A	1,835	1,637	89	N/A
	Live/Hard Bottom	1,639	105	5	12	1,835	204	11	2
	Artificial Reef	1,639	N/A	N/A	0	1,835	N/A	N/A	0
	Pelagic *Sargassum*	1,639	VAR	VAR	N/A	1,835	VAR	VAR	N/A
	Water Column	1,639	1,639	100	N/A	1,835	1,835	100	N/A
	Currents	1,639	1,639	100	N/A	1,835	1,691	92	N/A
	Nearshore	N/A	N/A	N/A	N/A	1,835	7	0.38	0
	HAPC	1,639	VAR	VAR	12	1,835	VAR	VAR	15

Table 1-2. Total Area (km²), percentage of known EFH, and number of individual EFH locations by known habitat type for each of the four proposed USWTR sites and corresponding trunk cable corridors (cont.).

USWTR Site (OPAREA)	EFH Type	Range Area (km^2)	Area of known EFH Type in Range (km^2)	Percent of Range Designated as EFH Type* (%)	EFH Type Points in Range (#)	Corridor Area (km^2)	Area of known FH Type in Corridor (km^2)	Percent of Corridor Designated as EFH Type* (%)	EFH Type Points in Corridor (#)
D (VACAPES)	Benthic Substrates[a]	1,591	1,591	100	N/A	1,480	1,480	100	N/A
	Live/Hard Bottom	1,591	0	0	1	1,480	0	0	22
	Artificial Reef	1,591	N/A	N/A	0	1,480	N/A	N/A	5
	Pelagic *Sargassum*	1,591	VAR	VAR	N/A	1,480	VAR	VAR	N/A
	Water Column	1,591	1,591	100	N/A	1,480	1,480	100	N/A
	Currents	1,591	0	0	N/A	1,480	0	0	N/A
	Nearshore	N/A	N/A	N/A	N/A	1,480	51	3	0
	HAPC	1,591	0	0	0	1,480	0	0	0

[a] Includes all sediment types excluding areas of live/hard bottom

N/A = Not applicable. No surface area information is available for GIS point data

VAR = Variable

*Based on existing surveys (SEAMAP 2001, 2007)

1.1.2 Site A—Jacksonville

- **Benthic Substrate EFH (not including live/hard bottom substrate)**

Range — There are 1,535 km^2 (448 NM^2) of benthic substrate in the range. Of this, 935 km^2 (273 NM^2) (61%) are designated as benthic substrate EFH (not including live/hard bottom) (Figure 1-1; Table 1-2) because 21 of the 88 species of fish and invertebrates encompassing 11 MUs use this area as EFH (Table A-1). The benthic substrates within the range that appear along the outer continental shelf and shelf break (~ 40 to 100 m [~ 131 to 329 ft]) are mostly carbonate sediments (medium to fine grain) that make up between 50% and 95% of sediments on the outer Florida-Hatteras Shelf and the adjacent Florida-Hatteras Slope (Jones et al. 1985; Emery and Uchupi 1972). Farther seaward on Blake Plateau, between 85% and 93% of sediments are composed of carbonate (Jones et al. 1985; Emery and Uchupi 1972).

Corridor — The area of the Site A corridor is 2,085 km^2 (608 NM^2). Of this area, 1,888 km^2 (550 NM^2) or 91% is designated as benthic substrate EFH (not including live/hard bottom) (Figure 1-1; Table 1-2) because 18 of the 88 species of fish and invertebrates encompassing eight MUs use this area as EFH (Table A-2). The benthic substrates in the corridor are similar to the range benthic substrates but the non-carbonate sediments, present in largest quantities in the corridor, are composed primarily of quartz, feldspar, glauconite, and phosphorite, with quartz comprising most of the nearshore, fine-grained sand (Jones et al. 1985).

- **Live/Hard Bottom EFH**

Range — Of the 1,535 km^2 (448 NM^2) of area in the range, 1,053.5 km^2 (307 NM^2) have been surveyed for hard bottom substrate and 600 km^2 (175 NM^2) have been identified as hard bottom (SEAMAP 2001, 2007). The SAFMC has designated this substrate, which is 57% of the surveyed area and 39% of the range, as live/hard bottom EFH (Figure 1-1; Table 1-2) for 18 of 52 species of fish and invertebrates encompassing six MUs (Table A-1). Shipwrecks exist in the range but are not depicted in the Figure 1-1 since they are not considered EFH by SAFMC.

The range is located in the southern portion of the Georgia Bight where the shelf is wide and gently slopes seaward. Throughout the shelf within the range, hard bottom consists of rock scarps, rock ledges, and flat top rocks with undercut channels that support sessile and colonizing organisms (Moser et al. 1995). The live/hard bottom communities in the range consist of hard and soft corals, bryozoans and sponges, and macroalgae, and support numerous snapper-grouper MU species (e.g., snapper-grouper complex) (BLM 1976; NOAA 2005). Live/hard bottom communities in the range are found on the relict rock-ridge system that extends along the shelf break and originated from the Holocene era. The rock-ridge system is composed of consolidated sediments, limestone algae, and sandstone (Kirby-Smith 1989; SEAMAP 2001, 2007).

The live/hard bottom communities in the range mostly contain deepwater corals, sponges, and amphipod tubes that support a myriad of fish species (BLM 1976). Threats to deep sea corals are mainly from trawling by modern fishing vessels, although gas exploration, drilling, seabed extraction, cable laying, and mining are just as destructive (Puglise et al. 2005; Morgan et al. 2006). Because deep sea corals are fragile, slow growing, and in some cases thousands of years old, physical anthropogenic impacts have lasting devastating effects (Roberts and Hirshfield 2004). Deep sea corals are fragile habitats that are now believed to contain more species than their shallow water counterparts but face serious danger from man-made threats, such as bottom fishing gear, ocean dumping, and mineral exploration (Freiwald et al. 2004). The deepwater coral reef known as the East Florida *Lophelia* Reefs grows on top of a ridge system extending along the shelf break. *Lophelia pertusa* is an ahermatypic hard coral found in all oceans, except at the poles. Its global depth range is

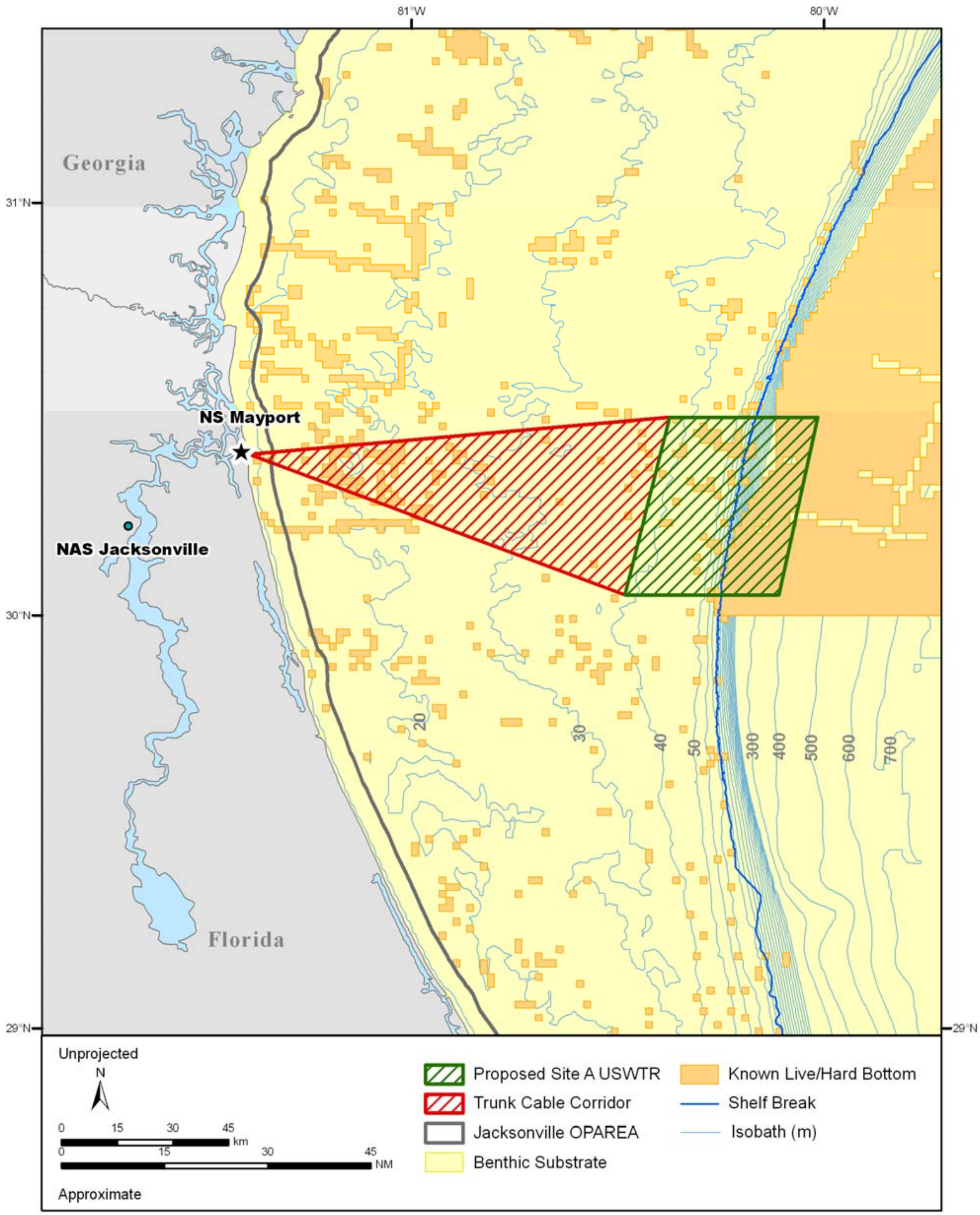

Figure 1-1. Location of benthic substrate and known live/hard bottom essential fish habitat (EFH) within the proposed Site A (Jacksonville) Undersea Warfare Training Range (USWTR) and corresponding trunk cable corridor, and surrounding Jacksonville Operating Area (OPAREA). Source data: SEAMAP (2001, 2007).

60 to 2,170 m (197 to 4,167 ft), but within the vicinity of the Site A range it is found in water depths between 200 and 500 m (656 and 1,640 ft) and temperatures around 10°C (Stetson et al. 1962; Ross 2004; NOAA 2005, 2006). *Lophelia pertusa* can form colonies up to 10 m (33 ft) high creating cauliflower-like frameworks and coral banks (Reed 2002) supporting commercially important species such as snapper-grouper MU species (Ross 2004).

The SAFMC has already developed strategies and plans to protect deep sea coral and sponge habitat. For example, there is a proposed HAPC site for the East Florida *Lophelia* Reef site located near Site A, which would prohibit bottom fishing gear and anchoring (SAFMC 2006a). In addition to the proposed HAPC near Site A, corals are protected under the SAFMC FMP for corals. This plan states that: "The Coral, Coral Reef and Live/Hardbottom Habitat Plan prohibits the harvest of stony corals, sea fans, coral reefs, and live rock except as authorized for scientific and educational purposes" (SAFMC 2006b).

Corridor ─ The corridor at Site A has an area of 2,085 km^2 (608 NM^2). Of this area, 1,588.5 km^2 (462 NM^2) have been surveyed for hard bottom substrate, and 197 km^2 (449 NM^2), or 12% of the surveyed area and 9% of the corridor, have been identified as hard bottom (SEAMAP 2001, 2007) (Figure 1-1; Table 1-2). Seventeen of the 51 species of fish and invertebrates encompassing five MUs use this area as EFH (Table A-2). The depiction of hard bottom is patchy due to a lack of data. The majority of hard bottom on the shelf off the coast of Florida in the corridor includes limestone outcroppings, coquina shells, and coral skeletal accretions that are colonized by sessile and colonial organisms (Jones et al. 1985). Shipwrecks exist in the range but are not depicted in the Figure 1-1 since they are not considered EFH by SAFMC.

- **Artificial Reef EFH**

Range ─ There are no artificial reefs in the range.

Corridor ─ Within the corridor which encompasses 2,085 km^2 (608 NM^2), 106 artificial reef complexes are designated as EFH (Figure 1-2; Table 1-2). Five species of fish and invertebrates encompassing two MUs use this area as EFH (Table A-2). The Florida Fish and Wildlife Conservation Commission (FFWCC), Division of Marine Fisheries, Bureau of Marine Fisheries Management supervises Florida's artificial reef program (FFWCC 2006).

Florida has strict guidelines as to what can be used as artificial reef material and the U.S. Army Corps of Engineers and Florida Department of Environmental Protection determines what materials can be used. Artificial reefs in Florida are composed of the following, in order of abundance: secondary concrete fixtures (43%), concrete modules (24%), military equipment (11%), ships and barges (11%), scrap steel (6%), and limestone (3%) (FFWCC 2006). Some of the most common species that occupy artificial reefs in Florida are in the snapper-grouper MU (e.g., gray snapper and vermillion snapper) (FFWCC 2006).

- **Pelagic *Sargassum* EFH**

Range ─ All of the 1,535 km^2 (448 NM^2) of the range could potentially contain pelagic *Sargassum* at any given time (Table 1-2). Twenty of the 52 species of fish and invertebrates encompassing three MUs use this habitat as EFH (Table A-1). Pelagic *Sargassum* has the potential to occur at any time, but is not always going to be present. Its distribution is dependent on winds and currents. It aggregates into floating mats called windrows and aligns itself in strips with the Gulf Stream which acts as a "conveyor belt" for many species of fish and invertebrates (Dooley 1972; Butler et al. 1983). The temperature requirements for *Sargassum* change seasonally but range from 15°C in the winter to 28°C in the summer (Garrison 2004). *Sargassum* also has high light requirements, and tolerates salinities between 35 and 36 psu (Hanisak and Samuel 1987; Garrison 2004). *Sargassum* is most abundant in the late fall after its summer growth period (Butler et al. 1983).

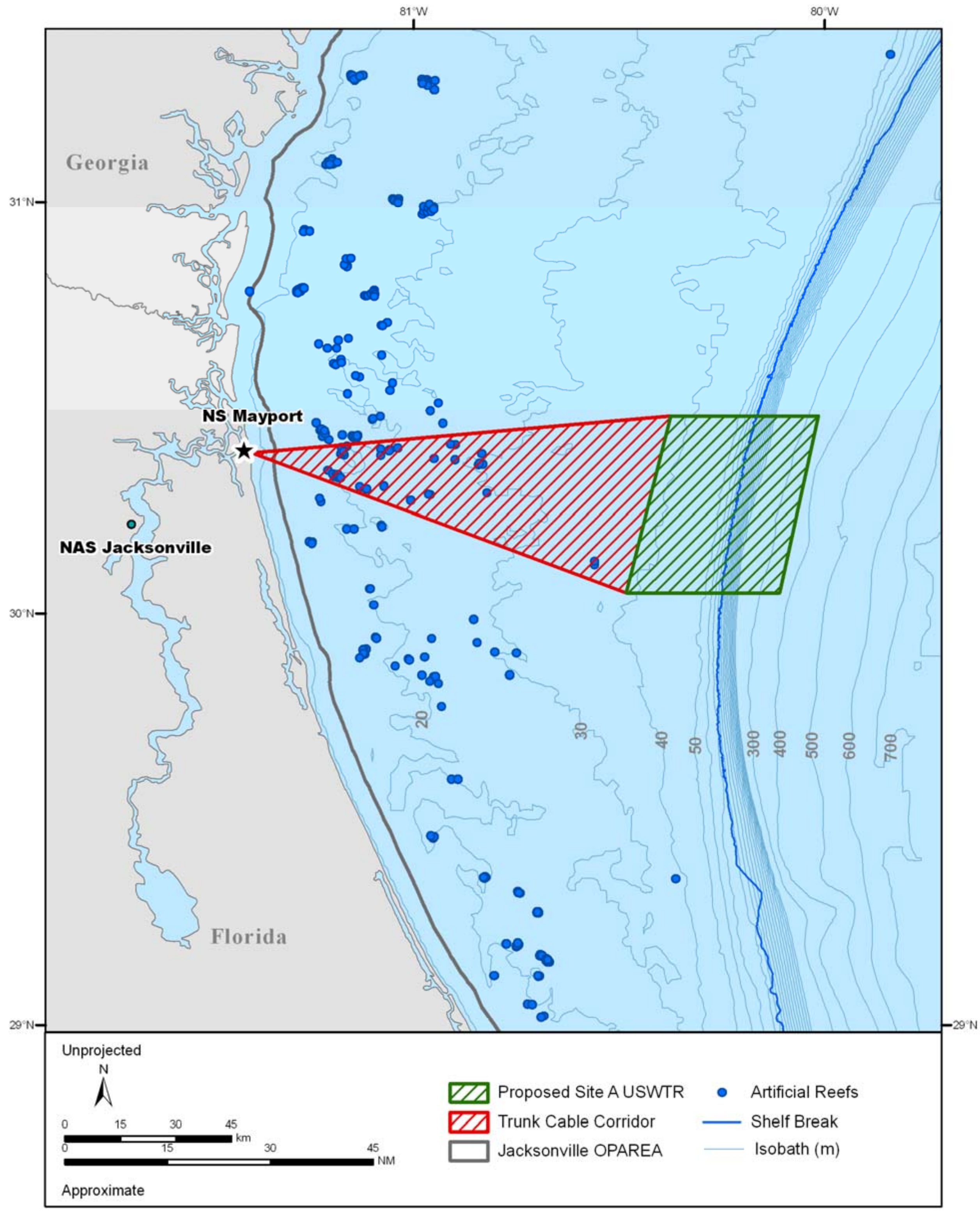

Figure 1-2. Artificial reefs designated as essential fish habitat (EFH) within the proposed Site A (Jacksonville) Undersea Warfare Training Range (USWTR) and corresponding trunk cable corridor, and surrounding Jacksonville Operating Area (OPAREA). Source data: GDNR (2001), Veridian (2001), FFWCC (2004), NCDMF (2005), and SCMRD (2005).

Corridor — All of the 2,085 km^2 (608 NM^2) of the corridor could potentially contain pelagic *Sargassum* at any given time (Figure 1-2; Table 1-2). Twenty of the 51 species of fish and invertebrates encompassing 3 MUs use this area as EFH (Table A-2). Pelagic *Sargassum* in the corridor provides the same opportunities for fish and invertebrates as it does within the range and requires the same environmental parameters to survive (see above). In the corridor it not only aligns itself with the western edge of the Gulf Stream but it also aligns with surface currents created by prevailing winds and forms windrows that commonly wash up on beaches (Butler et al. 1983).

- **Water Column EFH**

Range — The entire water column (100%) in the range is designated as EFH (Table 1-2) because 39 of the 52 species of fish and invertebrates encompassing 13 MUs use this area as EFH (Table A-1). The water column can be categorized into three layers: a surface water layer, a thermocline, and a deepwater layer (Schmitz et al. 1987). In the range the water column extends from 40 to 400 m (~131 to 1,312 ft). Circulation in the water column is controlled by both wind and water density, with wind-driven circulation dominating in the upper 100 m (329 ft) of the water column (Schmitz et al. 1987). The upper 100 m (329 ft) of the water column are controlled by wind driven circulation and below that, circulation is controlled through differences in water density which influence the thermocline and create vertical circulation, transporting nutrients and organisms to the surface (Schmitz et al. 1987). Plankton are organisms (e.g., fish eggs) found throughout the water column in the range. They support the oceanic food web and drift with the circulation in the water column and provide nutrition for many commercially important fish species (Parsons et al. 1984). The water column in the range also supports different lifestages of fish classified as highly migratory species (Table A-1).

Corridor — All of the water column (100%) in the corridor is designated as water column EFH (Figure 1-4; Table 1-2) because 39 of the 51 species of fish and invertebrates encompassing 11 MUs use this area as EFH (Table A-2). The main difference is the depth of the water column in the corridor which extends from ~ 40 to < 1 m (~ 130 to < 3 ft), and is subject to greater seasonal fluctuations in temperature and salinity. The water column in the corridor is also a popular spawning ground for snapper-grouper MU species because of its dynamic properties (i.e., mixing properties, temperature fluctuations, and proximity to estuaries and bays).

- **Currents EFH**

Range — The entire range (100%) is designated as currents EFH due to its relation to the Gulf Stream (Figure 1-3; Table 1-2). Twenty-nine species of fish and invertebrates encompassing nine MUs use this area as EFH (Table A-1). Currents on the continental shelf fluctuate seasonally and are predominantly wind driven, but are also influenced by tides, transient storm systems, changes in density caused by fresh water input, and intrusion by Gulf Stream waters (Shen et al. 2000; Marmorino et al 2002; Lentz et al. 2003). The dominant current in the range is the Gulf Stream which is a strong surface current that flows parallel to the coastline and transports warm equatorial waters into the cooler water of the North Atlantic (Garrison 2004). Frontal eddies commonly occur when the distance between the Gulf Stream and the coast is the greatest, such as off the coast of northern Florida (Yoder et al. 1981). These eddies often take the form of finger-like extensions that protrude onto the shelf, folding back to enclose a cold, nutrient-rich core of water upwelled from deep within the Gulf Stream (Mann and Lazier 1996).

Eddies and meanders extending from the Gulf Stream also play a critical role in transporting fish and invertebrates (particularly at the larval lifestage) from shelf waters into Gulf Stream waters.

Corridor — Current EFH covers approximately 1,432 km^2 (418 NM^2), or 69%, of the corridor closest to the proposed range (Figure 1-3; Table 1-2). This accounts for the westernmost meandering of the Gulf Stream as it flows north along the coast. Twenty-nine species of fish and invertebrates encompassing nine MUs use this area as EFH (Table A-2).

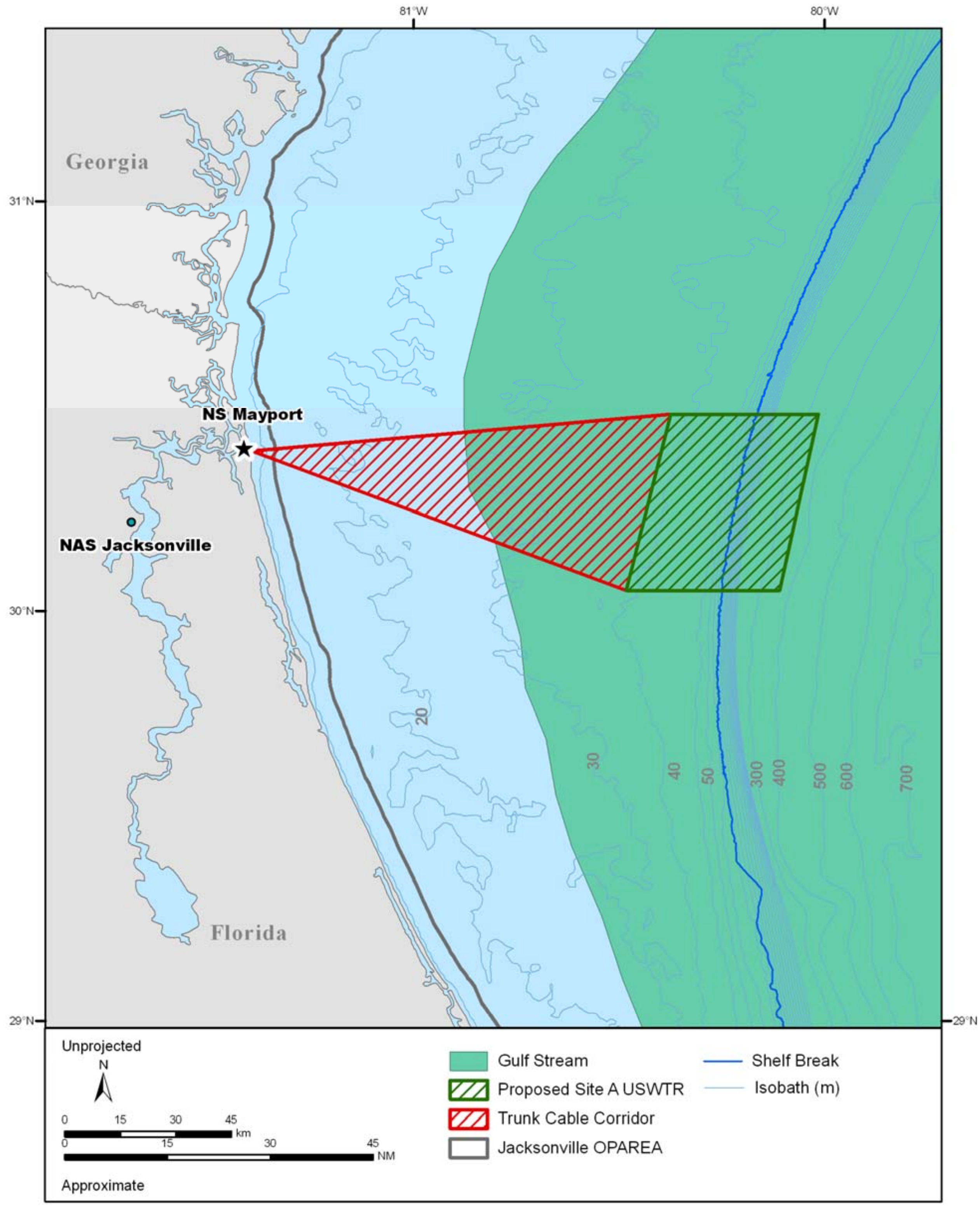

Figure 1-3. Location of currents as essential fish habitat (EFH) within the proposed Site A (Jacksonville) Undersea Warfare Training Range (USWTR) and corresponding trunk cable corridor, and surrounding Jacksonville Operating Area (OPAREA). Source data: SAFMC (2008).

- **Nearshore Habitat EFH**

  Range ─ There are no nearshore habitats in the range.

  Corridor ─ Less than 1% (Table 1-2) of nearshore habitat is designated as EFH. Forty-five of the 51 species of fish and invertebrates have designated EFH in the corridor encompassing 14 MUs (Table A-2). The SAFMC considers nearshore EFH (state waters) to include tidal freshwater; estuarine emergent vegetated wetlands (flooded salt marsh, brackish marsh, and tidal creeks); submerged rooted vascular plants (SAV); oyster reefs and shell banks; soft sediment bottom, hard bottom, ocean high-salinity surf zones, artificial reefs, and estuarine water column (SAFMC 1998). The nearshore habitat in the corridor is located in northeastern Florida near Jacksonville, FL and includes SAV, water column, and benthic substrates which are all EFH (hard and soft bottom).

- **HAPC**

  Range ─ Of the 1,535 km^2 (448 NM^2) of habitat in the range, surface waters are designated as HAPC when *Sargassum* is present (Figure 1-4; Table 1-2). Twenty-five of the 52 species of fish and invertebrates encompassing five MUs use this area as HAPC (Table A-1). HAPC are a subset of EFH and are areas of concern due to important ecological functions, the rarity of the habitat, the presence of stressful influences from man (e.g., trawling), or the sensitivity of the habitat to human-induced degradation (NMFS 2002a). The range has pelagic *Sargassum* (the most common HAPC), which is spawning habitat for coastal migratory pelagics MU species. Pelagic *Sargassum* in the range is dependent on currents and seasons (Dooley 1972). It aggregates into floating mats called windrows and aligns itself in strips with the Gulf Stream which acts as a conveyor belt for many species of fish and invertebrates transiting from the south to the north (Dooley 1972; Butler et al. 1983).

  Sargassum temperature requirements change seasonally, ranging from 15°C in the winter to 28°C in the summer months (Garrison 2004). It also has high light requirements, and tolerates salinities between 35 and 36 psu (Hanisak and Samuel 1987; Garrison 2004). *Sargassum* is most abundant in the late fall after its summer growth (Butler et al. 1983). The range also includes 146 benthic HAPC which includes the live/hard bottom communities used for spawning by members of the snapper-grouper complex mentioned above.

  Corridor ─ There are 2,085 km^2 (608 NM^2) of habitat in the corridor, and, like the range, surface waters in the corridor are designated as HAPC when *Sargassum* is present (Figure 1-4; Table 1-2). Twenty-six of 51 species of fish and invertebrates encompassing six MUs use this area as HAPC (Table A-2). HAPC in the corridor include only pelagic *Sargassum*, the presence of which provides the same opportunities for fish and invertebrates as it does within the range. In the corridor pelagic *Sargassum* also aligns with surface currents created by prevailing winds and forms windrows that commonly wash up on beaches (Butler et al. 1983). No benthic HAPC are designated in the corridor.

  Sargassum temperature requirements change seasonally, ranging from 15°C in the winter to 28°C in the summer months (Garrison 2004). It also has high light requirements, and tolerates salinities between 35 and 36 psu (Hanisak and Samuel 1987; Garrison 2004). *Sargassum* is most abundant in the late fall after its summer growth (Butler et al. 1983).

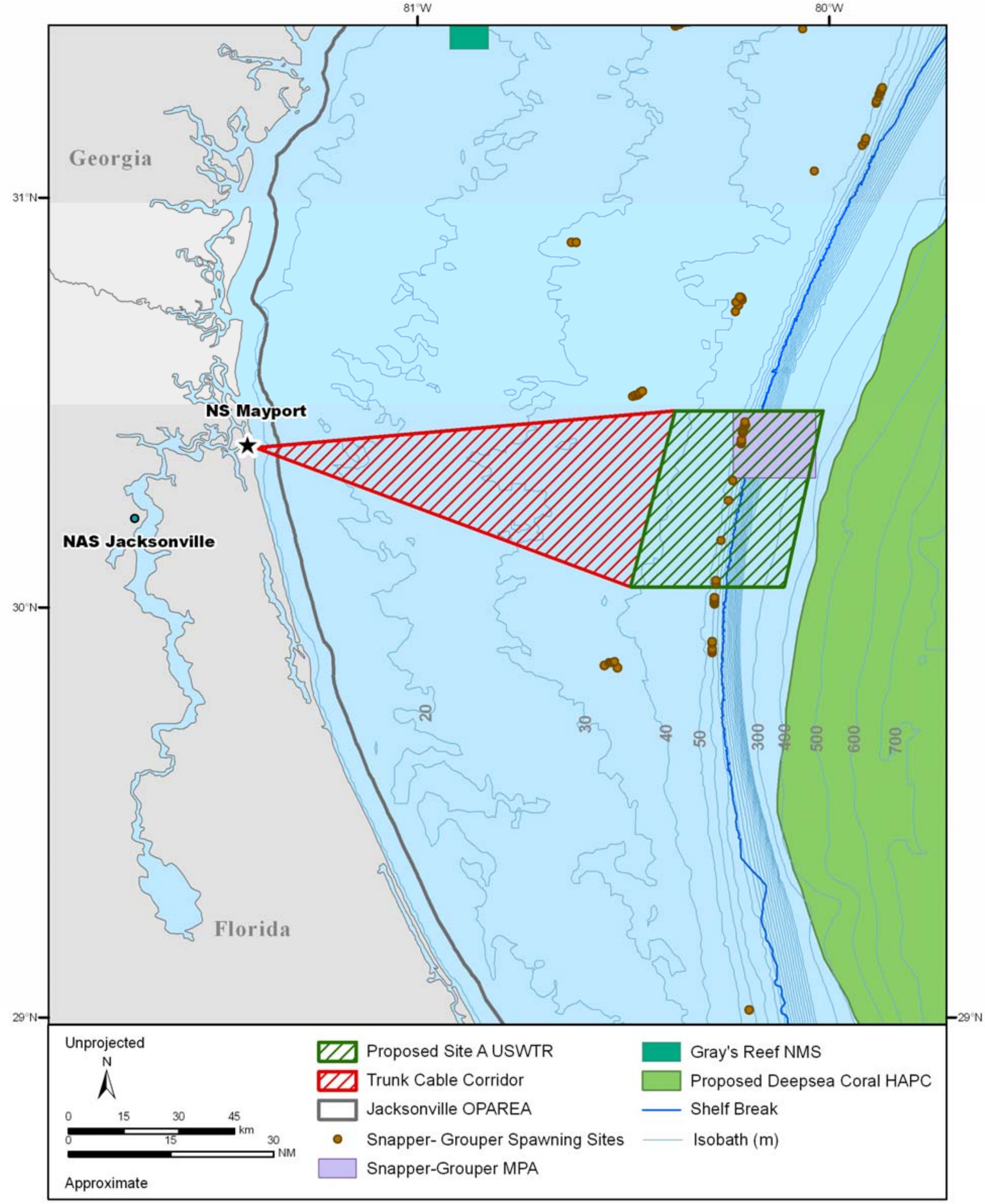

Figure 1-4. Location of surface waters and known benthic substrates (including biogenic reef communities) as habitats of particular concern (HAPC) within the proposed Site A (Jacksonville) Undersea Warfare Training Range (USWTR) and corresponding trunk cable corridor, and surrounding Jacksonville Operating Area (OPAREA). Source data: GDAIS (2005); Sedberry (2005).

1.1.3 Site B—Charleston

- **Benthic Substrate EFH (not including live/hard bottom substrate)**

  Range ─ The area of the range for Site B is 1,471 km^2 (428 NM^2). Of this area, 1,285 km^2 (375 NM^2), or 87%, of the total area is designated as EFH for nine MUs or 23 species (Figure 1-5; Table 1-2; Table A-3). Benthic substrates (not including live/hard bottom substrate) defined as EFH by the SAFMC are seafloor substrates on the continental shelf that consist of soft sediments such as gravel, cobbles, pebbles, sand, clay, mud, silt, and shell fragments, as well as the water-sediment interface directly above the bottom substrate. The Site B range encompasses the outer continental shelf (~30 to 200 m [98 to 656 ft]) to upper continental slope (from ~200 to ~400 m [~329 to ~1,312 ft]). The benthic substrate found in the range is composed primarily of quartzite or calcium carbonate (25% to 75%) sand (Hollister 1973; Amato 1994; USGS 2000). In addition to the dominant sandy substrate, the range sits directly over areas of sand or silty clay, clayey or silty sand, and an area of equal parts sand, silt, and clay (Amato 1994; Tucholke 1987; USGS 2000). The percentage of calcium carbonate in the sediments increases from between 25% and 75% to greater than 75% over Blake Plateau, which overlaps with the southeastern half of the range.

  Corridor ─ There are 1,217 km^2 (354 NM^2) of benthic substrate EFH (not including live/hard bottom) in the corridor. Of this area, 947 km^2 (276 NM^2), or 78%, is designated as benthic substrate EFH (not including hard bottom substrate) (Figure 1-5; Table 1-2) because 18 of the 56 species of fish and invertebrates encompassing five MUs use this area EFH (Table A-4). Non-carbonate sediments, present in largest quantities on the inner shelf, are composed primarily of quartz, feldspar, glauconite, and phosphorite, with quartz comprising most of the nearshore, fine-grained sand (Jones et al. 1985). The corridor at Site B is dominated by quartzite sandy sediments with some small areas of gravely sand (USGS 2000). Areas of calcium carbonate are mixed in with quartzite sand in this region and range between 25% and 75% calcium carbonate (Hollister 1973). The layers of sand and gravel found on the Florida-Hatteras Shelf and Slope are much thinner than those found north of Cape Hatteras, NC due primarily to the erosion and suspension induced by the Gulf Stream. Within the corridor, there are also numerous shoals and sand waves that extend from the coast across the continental shelf (Emery and Uchupi 1972; Murray and Thieler 2004). Shoals and sand waves are prominent physiographic features that contribute to benthic EFH in the corridor.

- **Live/Hard Bottom EFH**

  Range ─ Of the 1,471 km^2 (428 NM^2) of area in the range, 668 km^2 (195 NM^2) have been surveyed for hard bottom substrate and 186 km^2 (54 NM^2) have been identified as hard bottom substrate (SEAMAP 2001, 2007). The SAFMC has designated this substrate, which is 95% of the surveyed area, as live/hard bottom EFH (Figure 1-5; Table 1-2) for 19 species of fish and invertebrates encompassing six MUs (see also Table A-3). Throughout the shelf within the range, hard bottom substrate consists of rock scarps, rock ledges, and flat top rocks with undercut channels (BLM 1976; Moser et al. 1995; SEAMAP 2001). Within the range, a relict rock ridge exists encrusted with fauna and flora (live/hard bottom communities) and extends from Cape Hatteras, NC south to Florida along the shelf break. This rock originated in the Holocene era and was created by consolidated sediments, limestone algae, and sandstone (BLM 1976; Kirby-Smith 1989; SEAMAP 2001). No hard bottom substrate is shown on the slope beyond ~190 m (623 ft); however, this does not mean that hard bottom does not exist beyond this point, only that no surveys took place beyond that point. Overall, the slope region within the range is relatively smooth with no canyons (Milliman and Wright 1987). Shipwrecks exist in the range but are not depicted in the Figure 1-5 since they are not considered EFH by SAFMC.

  The live/hard bottom communities in the range mostly contain deepwater corals, sponges, and amphipod tubes that support a myriad of fish species (BLM 1976). Threats to deep sea corals are

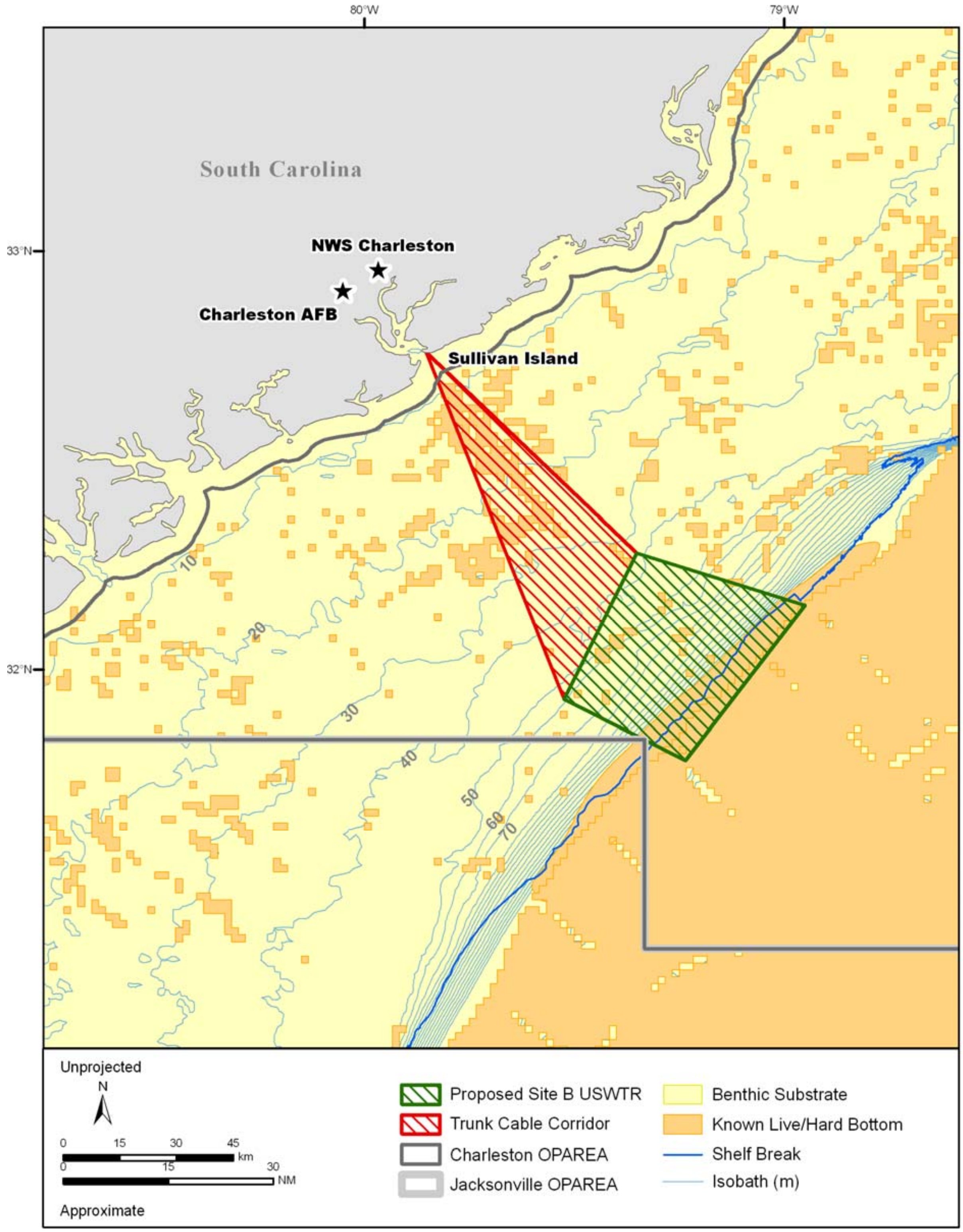

Figure 1-5. Location of benthic substrate and known live/hard bottom essential fish habitat (EFH) within the proposed Site B (Charleston) Undersea Warfare Training Range (USWTR) and corresponding trunk cable corridor, and surrounding Charleston Operating Area (OPAREA). Source data: SEAMAP (2001, 2007)

mainly from trawling by modern fishing vessels, although gas exploration, drilling, seabed extraction, cable laying, and mining are just as destructive (Puglise et al. 2005; Morgan et al. 2006). Because deep sea corals are fragile, slow growing, and in some cases thousands of years old, physical anthropogenic impacts have lasting devastating effects (Roberts and Hirshfield 2004). Deep sea corals are fragile habitats that are now believed to contain more species than their shallow water counterparts but face serious danger from man-made threats, such as bottom fishing gear, ocean dumping, and mineral exploration (Freiwald et al. 2004).

The areas of hard bottom substrate that occur within the range support hard and soft corals, bryozoans, and sponges, as well as numerous snapper-grouper MU species (BLM 1978; NOAA 2005). In addition there are two deepwater coral reefs known as the *Lophelia* Reefs that grow on top of a ridge system extending along the shelf break. *Lophelia pertusa* is an ahermatypic hard coral found in all oceans, except at the poles. Its global depth range is 60 to 2,170 m (197 to 4,167 ft), but within the vicinity of the Site B range it is found in water depths between 200 and 500 m (656 and 1,640 ft) and temperatures around 10°C (Stetson et al. 1962; Ross 2004; NOAA 2005, 2006). *Lophelia pertusa* can form colonies up to 10 m (33 ft) high creating cauliflower-like frameworks and coral banks (Reed 2002) supporting commercially important species such as snapper-grouper MU species (Ross 2004). The Savannah lithoherms, located in the southeastern portion of Site B, consist of dense mounds of *Lophelia pertusa* and *Enallopsammia profunda*, and are located 167 km (90 NM) off the coast of Savannah along the western edge of the Blake Plateau in water depths of 490 to 550 m (1,608 to 1,805 ft) (Reed and Ross, 2005; Reed et al., 2006). The *L. pertusa* mounds reach 30 to 60 m (98 to 197 ft) in height and occur along the Florida-Hatteras slope on the Charleston Bump (450 to 850 m [1,476 to 2,789 ft]) (Reed et al., 2006). The north faces of the lithoherms have exposed black phosphoritic pavements that support coral mounds. The mounds have a NNE-SSW orientation, are 10 m (33 ft) in height, average 1 km (3,281 ft) in length, and have 25° to 37° slopes (Reed et al., 2006). In addition to *L. pertusa* there are other coral and sponge species (10% of the total live coverage) found on the north faces of the high relief mounds such as black coral (*Antipathes* sp.), octocorals (gorgonians), and numerous species of sponges (fan sponges [*Phakellia* sp.], and glass sponges [Hexactinellida]) (Reed et al., 2006). The south slopes of the lithoherms have less of a slope (10°) and 90% of their substrate consists dead of *L. pertusa* and coarse sand (Reed et al., 2006).

Besides *Madrepora oculata*, no other coral species are found associated with *L. pertusa* in this area (Ross 2004). The SAFMC has already developed strategies and plans to protect deep sea coral and sponge habitat. For example, there is a proposed HAPC site for the Savannah Lithoherms *Lophelia* Reef site located near Site B, which would prohibit bottom fishing gear and anchoring (SAFMC 2006a). In addition to the proposed HAPC near Site B, corals are protected under the SAFMC FMP for corals. This plan states that: "The Coral, Coral Reef and Live/Hardbottom Habitat Plan prohibits the harvest of stony corals, sea fans, coral reefs, and live rock except as authorized for scientific and educational purposes" (SAFMC 2006b).

<u>Corridor</u> ─ The corridor at Site B has an area of 1,217 km^2 (354 NM^2). Of this area, 417 km^2 (122 NM^2) have been surveyed for hard bottom substrate, and 270 km^2 (79 NM^2), or 22%, have been identified as hard bottom (SEAMAP 2001, 2007) (Figure 1-5; Table 1-2). Fifteen of the 56 species of fish and invertebrates encompassing four MUs use this area as EFH (Table A-4). Within the corridor there are hard bottom data that were compiled by SEAMAP (2001). Shipwrecks exist in the range but are not depicted in the Figure 1-5 since they are not considered EFH by SAFMC. The majority of the hard bottom substrate in the corridor consists of rock outcroppings that have high, medium, and low relief forming scarps and ramps covered with thin layers of sediment (Emery and Uchupi 1972; Kirby-Smith 1989). The hard bottom closest to shore (around the shoals) is composed of medium to high relief flat-top rocks with undercut regions suggesting that strong currents are eroding the rocks in this area (Kirby-Smith 1989). Several live/hard bottom communities are found at shallower depths between 16 to 27 m (53 to 89 ft) off the coasts of North Carolina and South Carolina (BLM 1981;

SAFMC 1998). Farther offshore in the corridor, there are boulders and ledges supporting various encrusting fauna and flora (Kirby-Smith 1989).

The live/hard bottom communities in the corridor grow on top of exposed hard bottom and are composed of temperate hard (e.g., *Oculina arbuscula*) and soft corals, invertebrates, amphipods and many commercial fish species (Huntsman and Macintyre 1971). Off the coast of South Carolina, Georgia, and northern Florida the abundance of benthic communities (e.g., sponges, hard and soft corals, mollusks, decapods, echinoderms, and ascidians) remains consistent throughout the year on the inner shelf, because water temperatures are warmer and oceanographic conditions remain relatively consistent (Wenner et al. 1984).

- **Artificial Reef EFH**

Range ─ There are no known artificial reefs located in the proposed USWTR Site B.

Corridor ─ Within the 1,217 km^2 (354 NM^2) of area in the corridor there are 12 artificial reefs designated as EFH (Figure 1-6; Table 1-2) because four of the 56 species of fish and invertebrates encompassing four MUs use this area as EFH (Table A-4). The South Carolina Department of Natural Resources (SCDNR) established an artificial reef program in 1973. The artificial reef program is managed by the Office of Fisheries Management (OFM). SCDNR sites range in depth from 3 to 33 m (10 to 108 ft) and up to 56 km (30 NM) offshore. Sunken vessels are the most common reef material used along with concrete pipe, concrete bridges, steel docks, and military aircraft (SCDNR 2006). Ten thousand reefballs were deployed off the coast of South Carolina at 11 artificial reef complexes (RBF 2003). Various reeffish such as black sea bass and snappers (Lutjanidae) are attracted to these artificial structures (SCDNR 2006). Artificial reefs create ledges and caves, supplementing the natural hard bottom found in the corridor and attracting a variety of fish species with designated EFH (e.g., snapper-grouper complex).

- **Pelagic *Sargassum* EFH**

Range ─ All 1,471 km^2 (428 NM^2) of the range could potentially contain pelagic *Sargassum* at any given time (Table 1-2). Twenty of the 56 species of fish and invertebrates encompassing two MUs use this area as EFH (Table A-3). Pelagic *Sargassum* is defined by the SAFMC as mats or aggregations of the brown algae *Sargassum* (*Sargassum natans* and *S. fluitans*) which provides an important habitat for numerous fishes, especially larval lifestages (e.g., snapper-grouper MU). The SAFMC considers that pelagic *Sargassum* can occur from shore to the outer limits of the U.S. EEZ (SAFMC 1998). Pelagic *Sargassum* has the potential to occur throughout the entire range but will not always present in all parts of the range as its distribution is highly dependent on surface currents and near-surface winds. *Sargassum* aggregates into floating mats, forming windrows that align with the Gulf Stream, which acts as a conveyor belt for many species of fish and invertebrates transiting from the south to the north (Dooley 1972; Butler et al. 1983).

Sargassum temperature requirements change seasonally, ranging from 15°C in the winter to 28°C in the summer months (Garrison 2004). *Sargassum* also has high light requirements, and tolerates salinities between 35 and 36 psu (Hanisak and Samuel 1987; Garrison 2004). *Sargassum* is most abundant in the late fall after its summer growth period (Butler et al. 1983).

Corridor ─ All 1,217 km^2 (354 NM^2) of the corridor could potentially contain pelagic *Sargassum* at any given time (Table 1-2). Nineteen of the 56 species of fish and invertebrates encompassing three MUs use this area as EFH (Table A-4). Pelagic *Sargassum* in the corridor provides the same opportunities for fish and invertebrates as it does within the range and requires the same environmental parameters to survive. In the corridor *Sargassum* not only aligns in windrows with the western edge of the Gulf Stream but may also form into localized windrows aligned with surface currents created by prevailing winds over the shelf. *Sargassum* commonly washes up on beaches in the region (Butler et al. 1983).

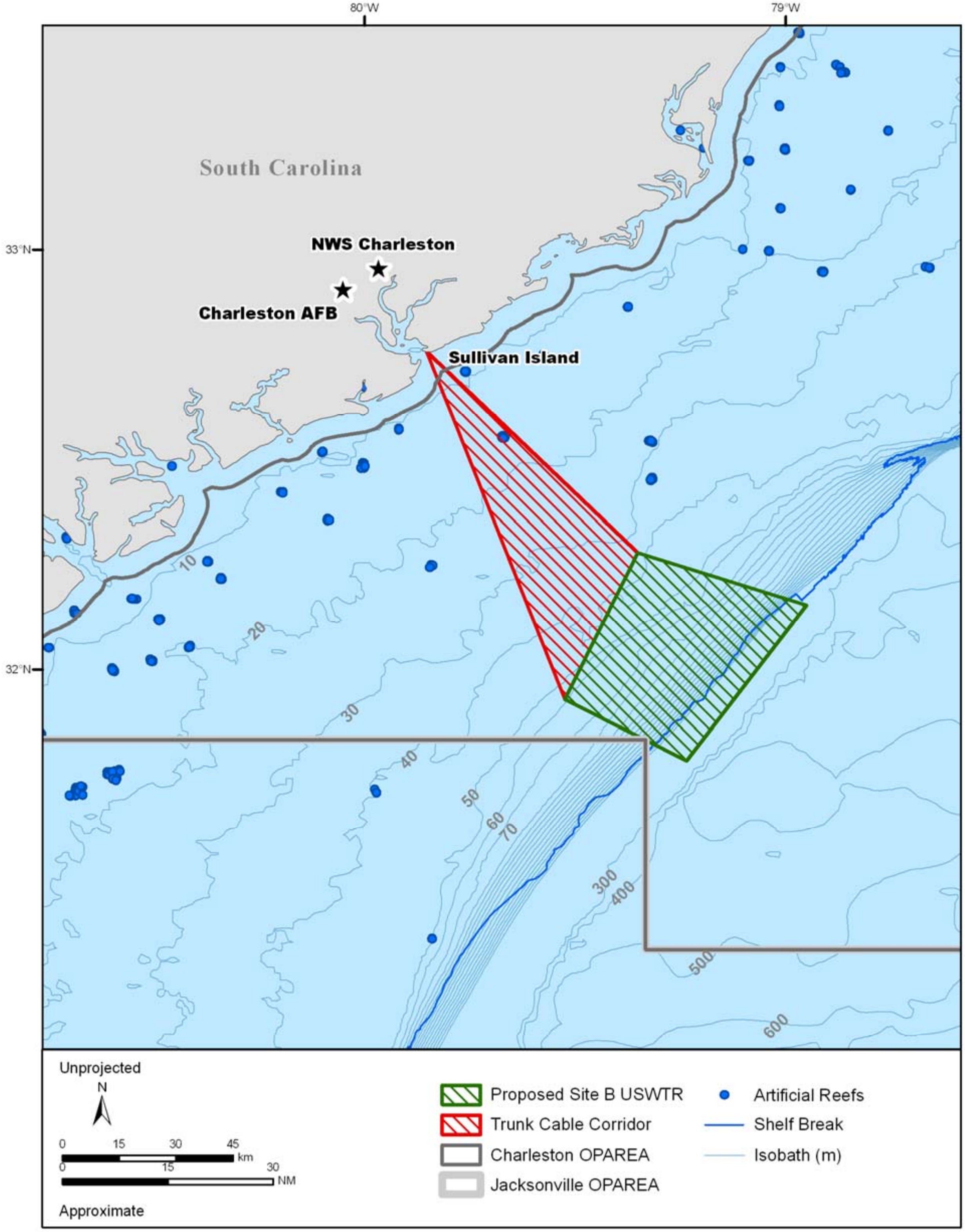

Figure 1-6. Location of artificial reefs as essential fish habitat (EFH) within the proposed Site B (Charleston) Undersea Warfare Training Range (USWTR) and corresponding trunk cable corridor, and surrounding Charleston Operating Area (OPAREA). Source data: SCMRD (2005).

- **Water Column EFH**

  Range ─ All (100%) of the water column in the 1,471 km^2 (428 NM^2) range is designated as EFH (Table 1-2) because 38 of the 56 species of fish and invertebrates encompassing 15 MUs use this area as EFH (Table A-3). The water column can be generally described as three layers: a surface layer extending to a depth of about 100 m (328 ft), a thermocline, and a deepwater layer extending from the bottom of the thermocline to the seafloor (Schmitz et al. 1987). The water column in the range extends from a depth of ~30 to 324 m (~98 to 1,063 ft). Circulation in the water column is controlled by both wind and differences in water density, with wind-driven circulation dominating in the upper 100 m (328 ft) of the water column (Mann and Lazier 1996). Below 100 m (328 ft) circulation is controlled primarily by differences in water density, which creates vertical circulation that transports nutrients and organisms into the surface layer when the forces influencing mixing are strong (Schmitz et al. 1987). Plankton consists of passively floating organisms found throughout the water column in the range. They are at the base of the oceanic food web and drift with the prevailing circulation; zooplankton also migrates vertically through the water column on a daily basis. Plankton provides nutrition for many commercially important fish species at various lifestages (Parsons et al. 1984). The water column is also a popular spawning ground for many different fish species such as the snapper-grouper MU. The water column in the range also supports different lifestages of fish classified as highly migratory species (Table A-3).

  Corridor ─ All (100%) of the water column in the 1,217 km^2 (354 NM^2) corridor is designated as water column EFH (Table 1-2) because 38 of the 56 species of fish and invertebrates encompassing 11 MUs use this area as EFH (Table A-4). The main difference in the water column between the range and the corridor is the depth of the water column in the corridor which extends from ~ 40 to < 1 m (~ 131 to < 3 ft), and is subject to greater seasonal fluctuations in temperature and salinity. The water column in the corridor is also a popular spawning ground for EFH species and is used by many fish and invertebrates because of its physical characteristics (i.e., constant mixing, wide ranging temperature fluctuations, and proximity to estuaries and bays).

- **Currents EFH**

  Range ─ All (100%) of the 1,471 km^2 (428 NM^2) range is designated as currents EFH (Figure 1-7; Table 1-2) because 31 of the 56 species of fish and invertebrates encompassing 10 MUs use this area as EFH (Table A-3). The dominant current in the range is the Gulf Stream which is a strong surface current that flows parallel to the coastline and transports warm equatorial waters into the cooler water of the North Atlantic (Garrison 2004). The Gulf Stream in the range also begins to form meanders (fluctuations in the current) of warm water that eventually could be pinched off to form cold or warm cells or rings that can transport tropical fish and invertebrate species closer to shore as is the case in warm water rings (Garrison 2004). There are deepwater currents that exist but are too deep (800+ m [2,625+ ft]) to affect the range except during times of upwelling. Eddies and meanders extending from the Gulf Stream also play a critical role in transporting fish and invertebrates (particularly at the larval lifestage) from shelf waters into Gulf Stream waters (Grothues and Cowen 1999).

  Corridor ─ Current EFH covers approximately 898 km^2 (262 NM^2), or 74%, of the corridor closest to the proposed range (Figure 1-7; Table 1-2). This accounts for the westernmost meandering of the Gulf Stream as it flows north along the coast. Thirty-one of the 56 species of fish and invertebrates encompassing 10 MUs use this area as EFH (Table A-4).

- **Nearshore Habitat EFH**

  Range ─ There is no nearshore habitat located within the range.

  Corridor ─ Less than 1% of the habitat in the corridor is designated as nearshore EFH (Table 1-2). Forty-two of the 56 species of fish and invertebrates have designated EFH in the corridor encompassing thirteen MUs (Table A-4). The SAFMC considers nearshore EFH (state waters) to

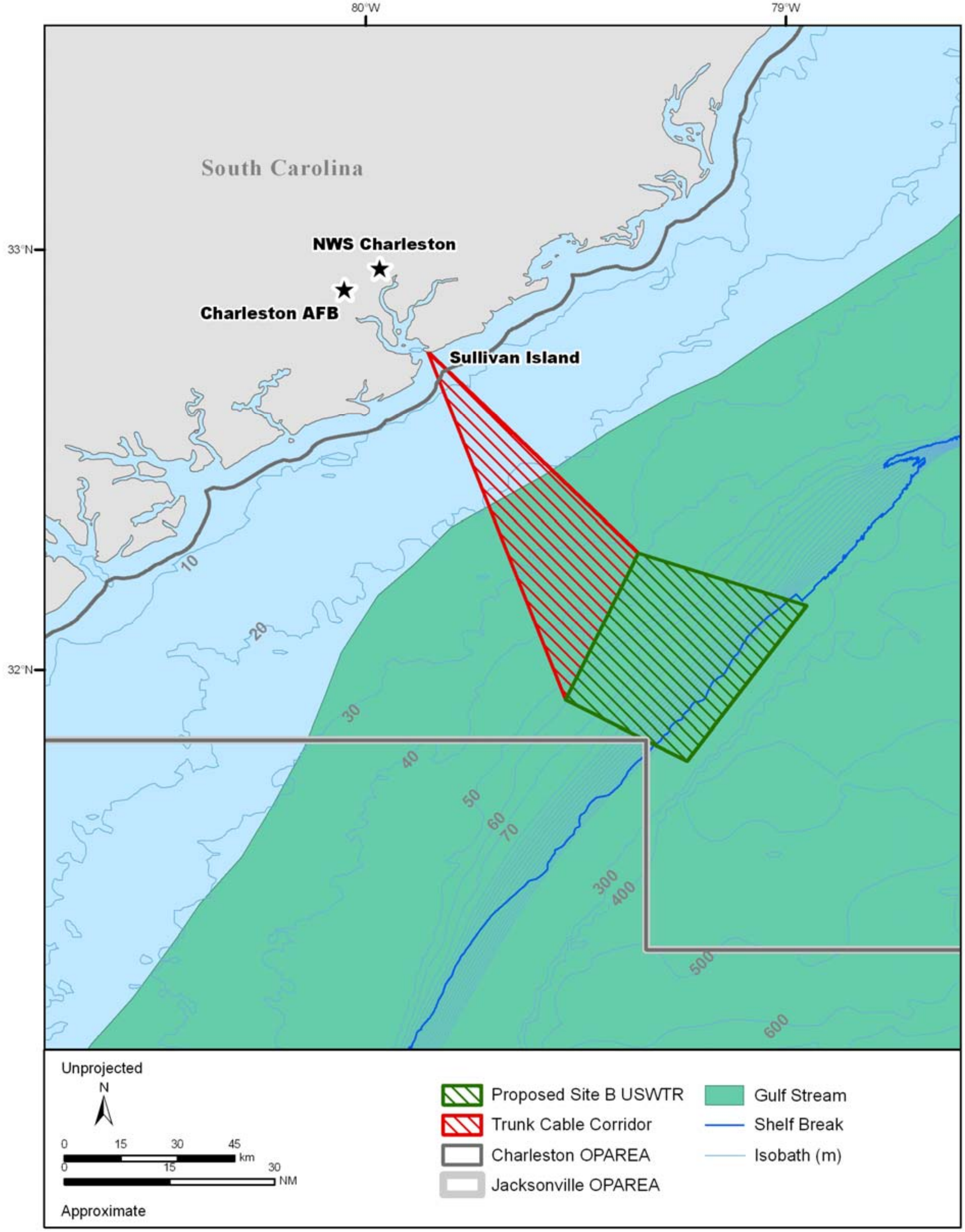

Figure 1-7. Location of currents as essential fish habitat (EFH) within the proposed Site B (Charleston) Undersea Warfare Training Range (USWTR) and corresponding trunk cable corridor, and surrounding Charleston Operating Area (OPAREA). Source data: SAFMC (2008).

include tidal freshwater; estuarine emergent vegetated wetlands (flooded salt marshes, brackish marsh, and tidal creeks); SAV; oyster reefs and shell banks; soft sediment bottom, hard bottom, ocean high salinity surf zones, artificial reefs, and estuarine water column (SAFMC 1998). In the corridor, the nearshore EFH is made up of estuaries and coastal embayments, wetlands, water column, oyster reefs, and areas of hard bottom (SAFMC 1998).

- **HAPC**

  Range ─ Of the 1,471 km^2 (428 NM^2) of habitat in the range, surface waters are designated as HAPC when *Sargassum* is present (Figure 1-8; Table 1-2). Twenty-five of the 56 species of fish and invertebrates encompassing seven MUs use this area as HAPC (Table A-3). HAPC are a subset of EFH and are areas of concern due to important ecological functions, the rarity of the habitat, the presence of stressful influences from man (e.g., trawling), or the sensitivity of the habitat to human-induced degradation (NMFS 2002a). Within the range, hermatypic corals (*L. pertusa*) form biogenic reefs and are designated as live/hard bottom HAPC, due to its use for spawning by members of the snapper-grouper complex,, and pelagic *Sargassum* (the most common HAPC) provides spawning habitat for multiple MU species (i.e., snapper-grouper).

  Corridor ─ Of the 1,217 km^2 (354 NM^2) of habitat in the corridor, surface waters are designated as HAPC when *Sargassum* is present (Figure 1-8; Table 1-2). HAPC have been designated for 26 species of fish and invertebrates in six MUs (see Table A-4). HAPC in the corridor, like the range, consist of multiple habitats including live/hard bottom communities (benthic HAPC) and pelagic *Sargassum* (surface HAPC).

1.1.4 Site C—Cherry Point

- **Benthic Substrate EFH (not including live/hard bottom substrate)**

  Range ─ The area of the range for Site C is 1,639 km^2 (478 NM^2). Of this area, 1,534 km^2 (447 NM^2), or 94%, of the total area is designated as EFH for 22 species in 10 MUs (Figure 1-9; Tables 1-2 and A-5). Benthic substrates (not including live/hard bottom substrate) defined as EFH by the SAFMC are seafloor substrates on the continental shelf that consist of soft sediments such as gravel, cobbles, pebbles, sand, clay, mud, silt, and shell fragments, as well as the water-sediment interface directly above the bottom substrate. The Site C range encompasses the outer continental shelf (~40 to 100 m [~ 131 to 328 ft) to upper continental slope (from ~ 100 to 400 m [~ 329 to 1,312 ft]). The benthic substrate found in the range is composed primarily of quartzite or calcium carbonate (25% to 75%) sand or thin layers of fine-grained sand and silt (Hollister 1973; Amato 1994; USGS 2000; Street et al. 2005). As the water depth increases in the range, sand remains the dominant sediment, which is uncommon for a continental slope region (Tucholke 1987). With depth, the percent composition of calcium carbonate increases from 25% to 75% and more silt and clay sediments are present (Hollister 1973).

  Corridor ─ The corridor encompasses 1,835 km^2 (535 NM^2) of ocean bottom. Of this area, 1,637 km^2 (477 NM^2), or 89%, is designated as benthic substrate EFH (not including live/hard bottom substrate) (Figure 1-9; Table 1-2) because 20 of the 56 species of fish and invertebrates encompassing nine MUs use this area EFH (Table A-6). The corridor in Onslow Bay is made up of mostly two types of sediments: gravelly coarse sand and fine sand (USGS 2000). Gravelly coarse sand occurs throughout Onslow Bay in between areas of hard bottom substrate made up of mostly shell debris and rock lithocasts that originated from the Holocene era (Riggs et al. 1996). The fine sand found in the bay originated from hard bottom substrate created in the Tertiary and Pleistocene era which is being eroded from current action (Riggs et al. 1996). The total amount of calcium carbonate mixed in with sand in this region is between 25% and 75% (Hollister 1973). There is very little new sediment input

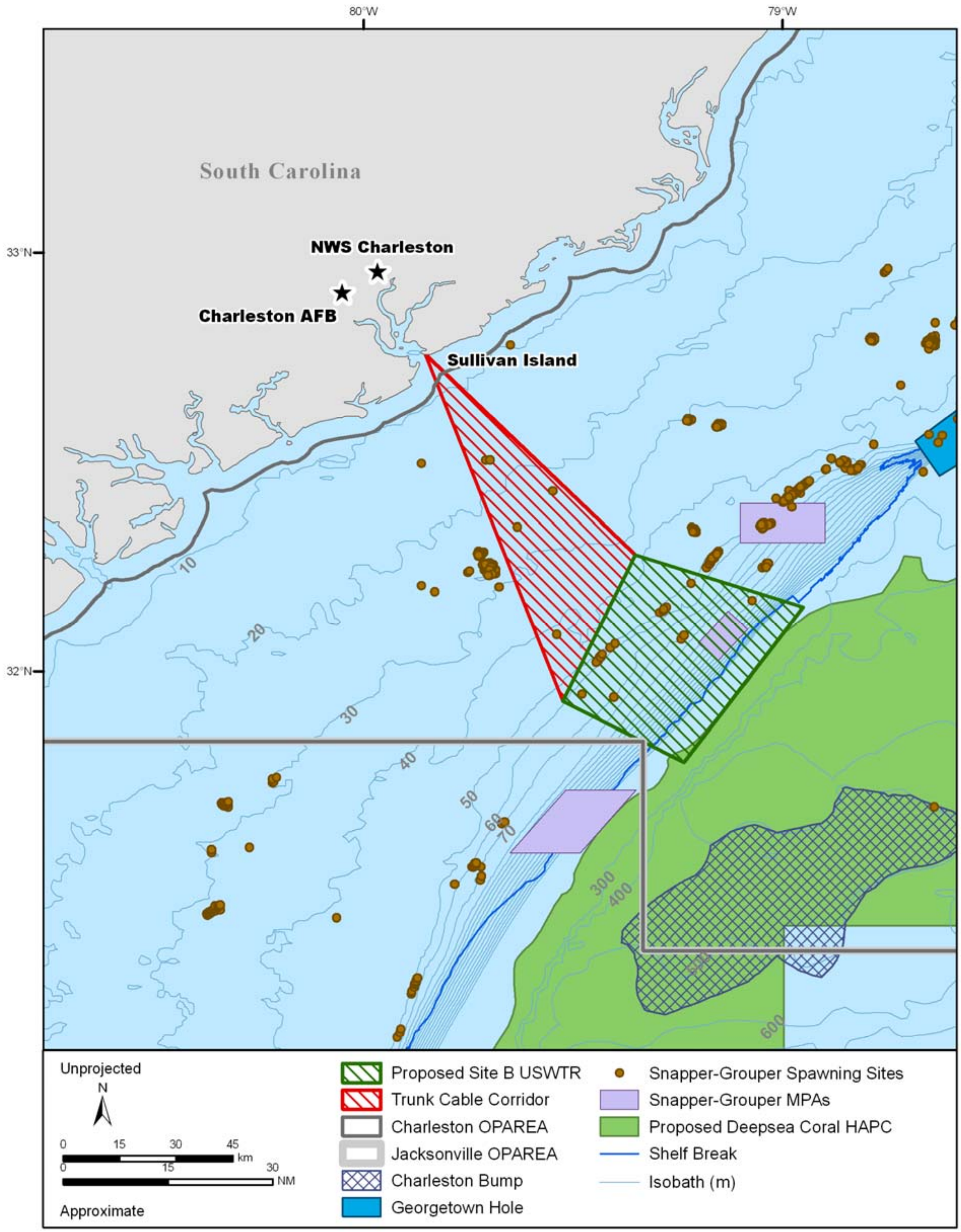

Figure 1-8. Location of surface waters and known benthic substrates (including biogenic reef communities) as habitats of particular concern (HAPC) within the proposed Site B (Charleston) Undersea Warfare Training Range (USWTR) and corresponding trunk cable corridor, and surrounding Charleston Operating Area (OPAREA). Source data: GDAIS (2005); Sedberry (2005).

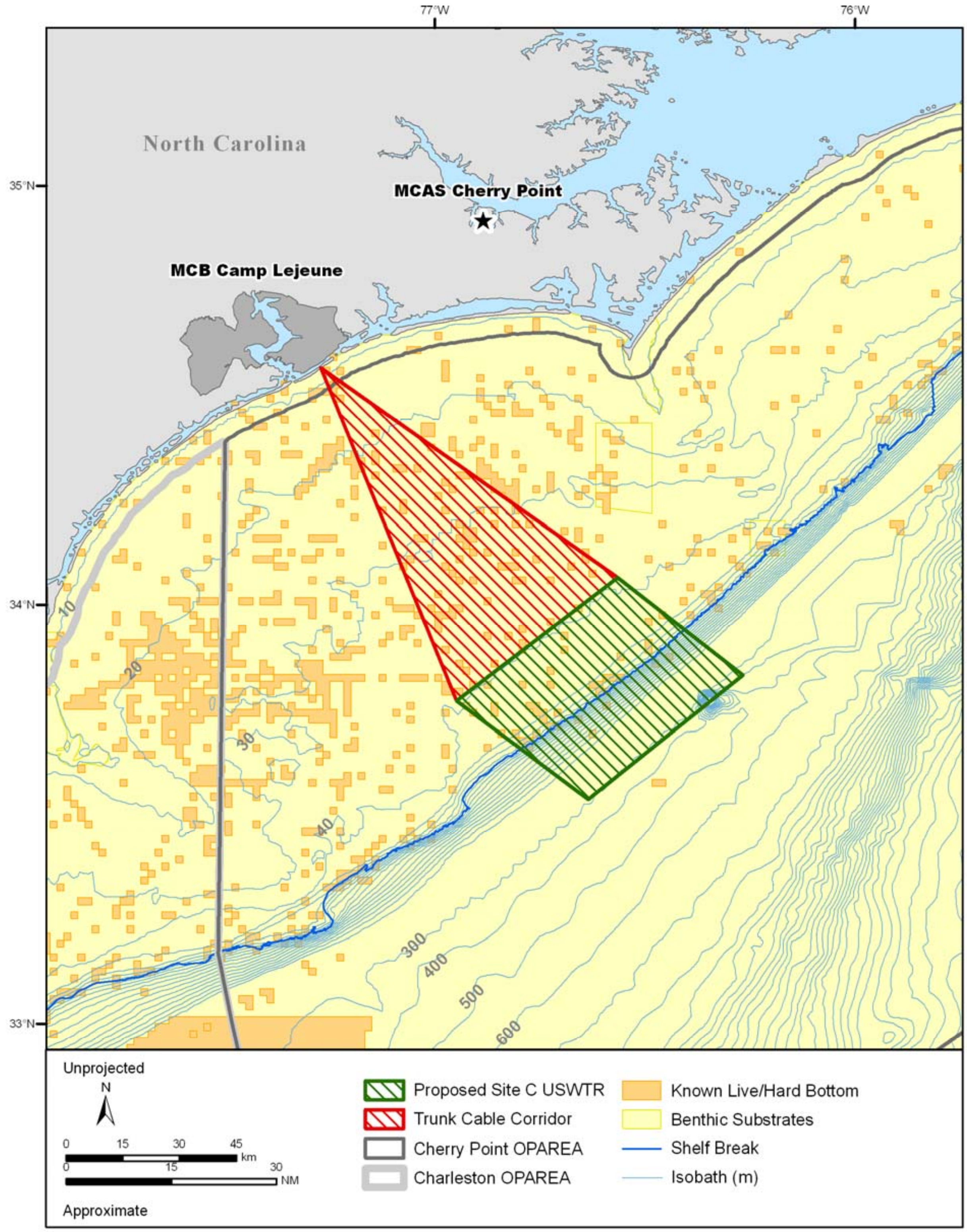

Figure 1-9. Location of benthic substrate and known live/hard bottom essential fish habitat (EFH) within the proposed Site C (Cherry Point) Undersea Warfare Training Range (USWTR) and corresponding trunk cable corridor, and surrounding Cherry Point Operating Area (OPAREA). Source data: SEAMAP (2001, 2007).

from rivers and estuaries onto the continental shelf off the coast of North Carolina, resulting in sediment deprivation (Street et al. 2005). Within the corridor there are also numerous shoals and sand waves that extend from the coast across the continental shelf (Emery and Uchupi 1972). Shoals and sand waves are prominent physiographic features that contribute to benthic EFH in the corridor.

- **Live/Hard Bottom EFH**

Range ─ Of the 1,639 km^2 (478 NM^2) of area in the range, 905 km^2 (263 NM^2) have been surveyed for hard bottom substrate and 105 km^2 (31 NM^2) have been identified as hard bottom substrate (SEAMAP 2001, 2007). The SAFMC has designated this area, which is 6% of the surveyed area, as known hard bottom EFH (Figure 1-9; Table 1-2) for 17 species of fish and invertebrates encompassing seven MUs (Table A-5). Throughout the shelf within the range hard bottom substrate consists of rock scarps, rock ledges, and flat top rocks with undercut channels (BLM 1976; Moser et al. 1995; SEAMAP 2001). Within the range a relict rock ridge exists encrusted with fauna and flora (hard bottom communities) and extends from Cape Hatteras, NC south to Florida along the shelf break. This rock originated in the Holocene era and was created by consolidated sediments, limestone algae, and sandstone (BLM 1976; Kirby-Smith 1989; SEAMAP 2001). Shipwrecks exist in the range but are not depicted in the Figure 1-9 since they are not considered EFH by SAFMC.

The live/hard bottom communities in the range mostly contain deepwater corals, sponges, and amphipod tubes that support a myriad of fish species (BLM 1976). Deep sea corals are fragile habitats that are now believed to contain more species than their shallow water counterparts but face serious danger from man-made threats, such as crushing bottom fishing gear, ocean dumping, and mineral exploration (Freiwald et al. 2004). Within the range there are outer shelf live/hard bottom communities. These communities not only support hard and soft corals, bryozoans, and sponges, but numerous snapper-grouper MU species (BLM 1976; NOAA 2005). In addition, there are two deepwater coral reefs known as the *Lophelia* banks that grow on top of a ridge system extending along the shelf break. *Lophelia pertusa* is an ahermatypic hard coral found in all oceans but polar. Its global depth range is 60 to 2,170 m (197 to 4,167 ft), but within the Site C range it is found in water depths between 200 and 1,000 m (656 and 3,280 ft) and temperatures around 10°C (Stetson et al. 1962; Ross 2004; NOAA 2005, 2006). *Lophelia pertusa* can form colonies up to 10 m (33 ft) tall creating cauliflower-like frameworks and coral banks (Reed 2002) supporting commercially important species such as snapper-grouper MU species (Ross 2004).

Besides *Madrepora oculata*, no other coral species are found associated with *L. pertusa* in this area (Ross 2004). The SAFMC has already developed strategies and plans to protect deep sea coral and sponge habitat. For example, there is a proposed HAPC site for the Cape Lookout *Lophelia* Banks located near Site C, which would prohibit bottom fishing gear and anchoring (SAFMC 2006a). In addition to the proposed HAPC near Site C, corals are protected under the SAFMC FMP for corals. This plan states that: "The Coral, Coral Reef and Live/Hardbottom Habitat Plan prohibits the harvest of stony corals, sea fans, coral reefs, and live rock except as authorized for scientific and educational purposes" (SAFMC 2006b).

Corridor ─ The corridor at Site C has an area of 1,835 km^2 (535 NM^2). Of this, 1,021 km^2 (298 NM^2) has been surveyed for hard bottom substrate, and 204 km^2 (59 NM^2) or 11% have been identified as hard bottom (SEAMAP 2001, 2007) (Figure 1-9; Table 1-2). Seventeen of the 56 species of fish and invertebrates encompassing seven MUs use this area as EFH (Table A-6). Within the corridor there are hard bottom data that were compiled by SEAMAP (2001). Shipwrecks exist in the range but are not depicted in the Figure 1-9 since they are not considered EFH by SAFMC. The majority of the hard bottom substrate in the corridor consists of rock outcroppings that have high, medium, and low relief forming scarps and ramps covered with thin layers of sediment (Emery and Uchupi 1972; Kirby-Smith 1989). The hard bottom closest to shore (around the shoals) is composed of medium to high relief flat-top rocks with undercut regions suggesting that strong currents are eroding the rocks in this area (Kirby-Smith 1989). Further offshore in the corridor there are boulders and ledges supporting various encrusting fauna and flora (Kirby-Smith 1989). Live/hard bottom communities in the corridor grow on top of the exposed hard bottom and are composed of temperate hard (*Oculina arbuscula*) and soft corals, invertebrates, amphipods and many commercial fish species (Huntsman and Macintyre 1971; NCDMF 2005).

- **Artificial Reef EFH**

Range ─ Within the 1,639 km^2 (478 NM^2) of area in the range, there are 10 artificial reefs designated as EFH (Figure 1-10; Table 1-2) because four of the 56 species of fish and invertebrates encompassing two MUs use this area as EFH (Table A-5). Artificial reefs in North Carolina are managed by the North Carolina Division of Marine Fisheries (NCDMF). In North Carolina, an artificial reef complex may contain many individual artificial reefs (NCDMF 2005). The individual reefs that make up the artificial reef complexes in the range include one transport barge (137 m [450 ft]) and multiple pieces of concrete (NCDMF 2005).

Corridor ─ Within the 1,835 km^2 (535 NM^2) of area in the corridor there are 30 artificial reefs designated as EFH (Figure 1-10; Table 1-2) because four of the 56 species of fish and invertebrates encompassing one MU use this area as EFH (Table A-6). The artificial reefs in the corridor are also managed by the NCDMF. There are two artificial reefs in the northeast corner of the corridor. They are made up of concrete pipes and three ships ranging in length from 53 to 133 m (174 to 436 ft) (NCDMF 2005). The artificial reefs create ledges and caves supplementing the natural hard bottom found in the corridor which attract many fish species such as snapper-grouper MU species.

- **Pelagic *Sargassum* EFH**

Range ─ All 1,639 km^2 (478 NM^2) of the range could potentially contain pelagic *Sargassum* at any given time (Table 1-2). Seventeen of the 56 species of fish and invertebrates encompassing three MUs use this area as EFH (Table A-5). Pelagic *Sargassum* is defined by the SAFMC as mats or aggregations of the brown algae *Sargassum* (*Sargassum natans* and *S. fluitans*) which provides an important habitat for numerous fishes, especially larval lifestages (e.g., snapper grouper MU). The SAFMC considers that pelagic *Sargassum* can occur from shore to the outer limits of the U.S. EEZ (SAFMC 1998). Pelagic *Sargassum* has the potential to occur throughout the entire range but is not always present in all parts of the range as its distribution is highly dependent on surface currents and winds. *Sargassum* aggregates into floating mats, forming windrows that align with the Gulf Stream, which acts as a conveyor belt for many species of fish and invertebrates transiting from the south to the north (Dooley 1972; Butler et al. 1983).

Sargassum temperature requirements change seasonally, ranging from 15°C in the winter to 28°C in the summer months (Garrison 2004). It also has high light requirements, and tolerates salinities between 35 and 36 psu (Hanisak and Samuel 1987; Garrison 2004). *Sargassum* is most abundant in the late fall after its summer growth (Butler et al. 1983).

Corridor ─ All 1,835 km^2 (535 NM^2) of the corridor could potentially contain pelagic *Sargassum* at any given time (Table 1-2). Eighteen of the 56 species of fish and invertebrates encompassing two MUs use this area as EFH (Table A-6). Pelagic *Sargassum* in the corridor provides the same opportunities for fish and invertebrates as it does within the range and requires the same environmental parameters to survive. In the corridor *Sargassum* not only aligns in windrows with the western edge of the Gulf Stream but may also form into windrows with surface currents created by prevailing winds over the shelf, and commonly washes up on beaches (Butler et al. 1983).

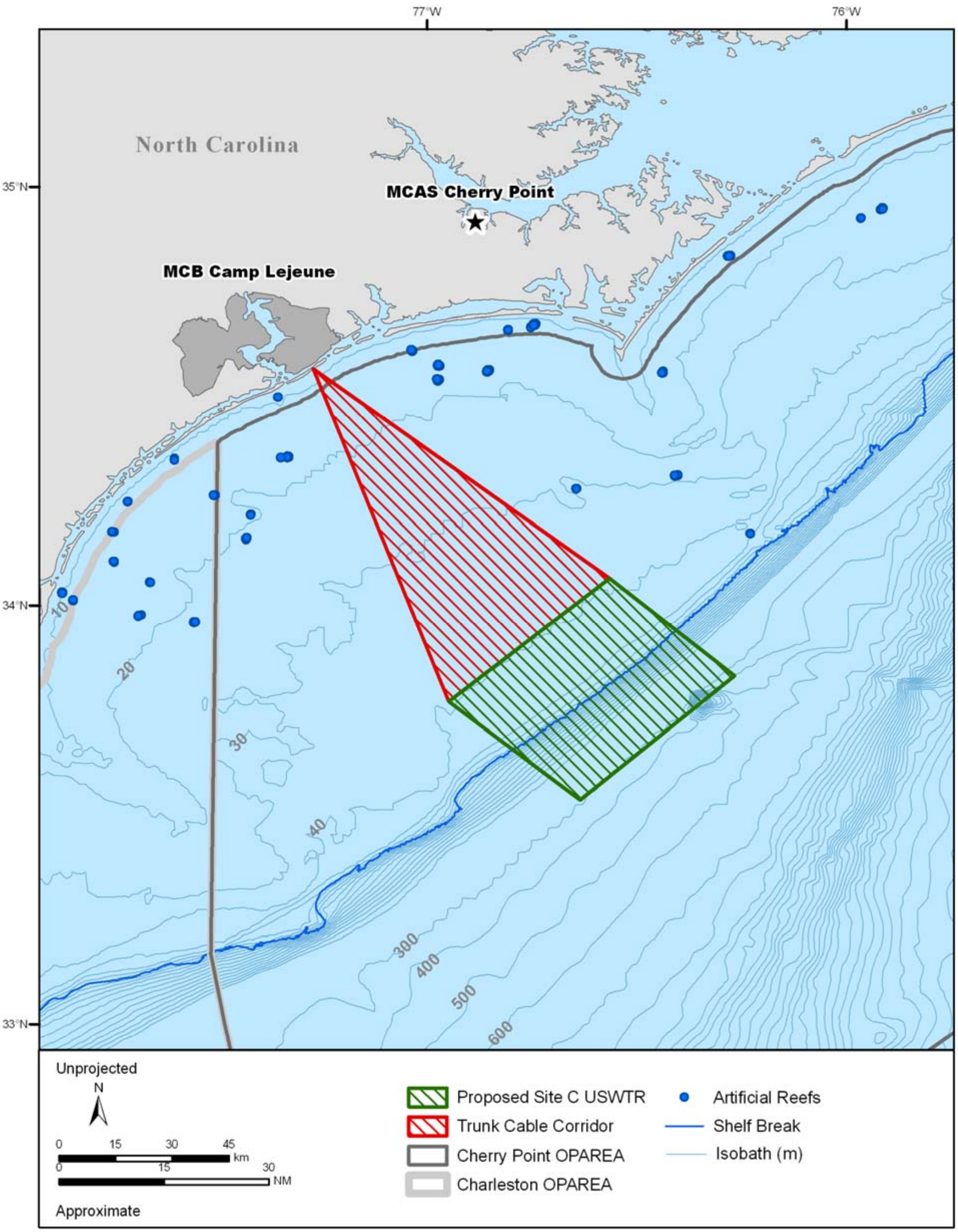

Figure 1-10. Location of artificial reefs as essential fish habitat (EFH) within the proposed Site C (Cherry Point) Undersea Warfare Training Range (USWTR) and corresponding trunk cable corridor, and surrounding Cherry Point Operating Area (OPAREA). Source data: NCDMF (2005).

- **Water Column EFH**

  Range ─ All (100%) of the water column in the 1,639 km^2 (478 NM^2) range is designated as EFH (Table 1-2) because 40 of the 56 species of fish and invertebrates encompassing 15 MUs use this area as EFH (Table A-5). The water column can be generally described as three layers: a surface layer extending to a depth of about 100 m (328 ft), a thermocline, and a deepwater layer extending from the bottom of the thermocline to the seafloor (Schmitz et al. 1987). The water column in the range extends from a depth of ~ 40 to 402 m (~ 131 to 1,329 ft). Circulation in the water column is controlled by both wind and differences in water density, with wind-driven circulation dominating in the upper 100 m (328 ft) of the water column (Mann and Lazier 1996). Below 100 m (328 ft), circulation is controlled primarily by differences in water density, which create vertical circulation transporting nutrients and organisms into the surface layer when the forces influencing mixing are strong (Schmitz et al. 1987). Plankton are organisms found throughout the water column in the range. They are at the base of the oceanic food web and drift with the prevailing circulation; many zooplankton also migrate vertically through the water column on a daily basis. Plankton provide nutrition for many commercially important fish species at various lifestages (Parsons et al. 1984). The water column is also a popular spawning ground for many different fish species such as the snapper-grouper MU. The water column in the range also supports different lifestages of species in the fish classified as highly migratory species (Table A-5).

  Corridor ─ All (100%) of the water column in the 1,835 km^2 (535 NM^2) corridor is designated as water column EFH (Table 1-2) because 38 of the 56 species of fish and invertebrates encompassing 13 MUs use this area as EFH (Table A-6). The main difference in the water column between the range and the corridor is the depth of the water column in the corridor which extends from ~ 40 to < 1 m (~ 131 to < 3 ft), and is subject to greater seasonal fluctuations in temperature and salinity. The water column in the corridor is also a popular spawning ground for MU species and is used by many species of fish and invertebrates because of its physical properties (i.e., constant mixing, wide ranging temperature fluctuations, and proximity to estuaries and bays).

- **Currents EFH**

  Range ─ All (100%) 1,639 km^2 (478 NM^2) in the range is designated as current EFH (Figure 1-11; Table 1-2) because 29 of the 56 species of fish and invertebrates encompassing 10 MUs use this area as EFH (Table A-5). The dominant current in the range is the Gulf Stream which is a strong surface current that flows parallel to the coastline and transports warm equatorial waters into the cooler water of the North Atlantic (Garrison 2004). The Gulf Stream in the range also begins to form meanders (fluctuations in the current) of warm water that eventually could be pinched off to form cold or warm cells or rings that can transport tropical fish and invertebrate species closer to shore as is the case in warm water rings (Garrison 2004). There are deepwater currents that exist but are too deep (800+ m [2,625+ ft]) to affect the range except during times of upwelling. Eddies and meanders extending from the Gulf Stream also play a critical role in transporting fish and invertebrates (particularly at the larval lifestage) from shelf waters into Gulf Stream waters (Grothues and Cowen 1999).

  Corridor ─ Current EFH covers approximately 1,691 km^2 (262 NM^2), or 92%, of the corridor closest to the proposed range (Figure 1-11; Table A-2). This accounts for the westernmost meandering of the Gulf Stream as it flows north along the coast. Twenty-nine of the 56 species of fish and invertebrates encompassing 10 MUs use this area as EFH (Table A-6).

- **Nearshore Habitat EFH**

  Range ─ There is no nearshore habitat located within the range.

  Corridor ─ Less than 1% of the habitat in the corridor is designated as nearshore EFH (Table 1-2). Thirty-nine of the 56 species of fish and invertebrates have designated EFH in the corridor encompassing 14 MUs (Table A-6). The SAFMC considers nearshore EFH (state waters) to include

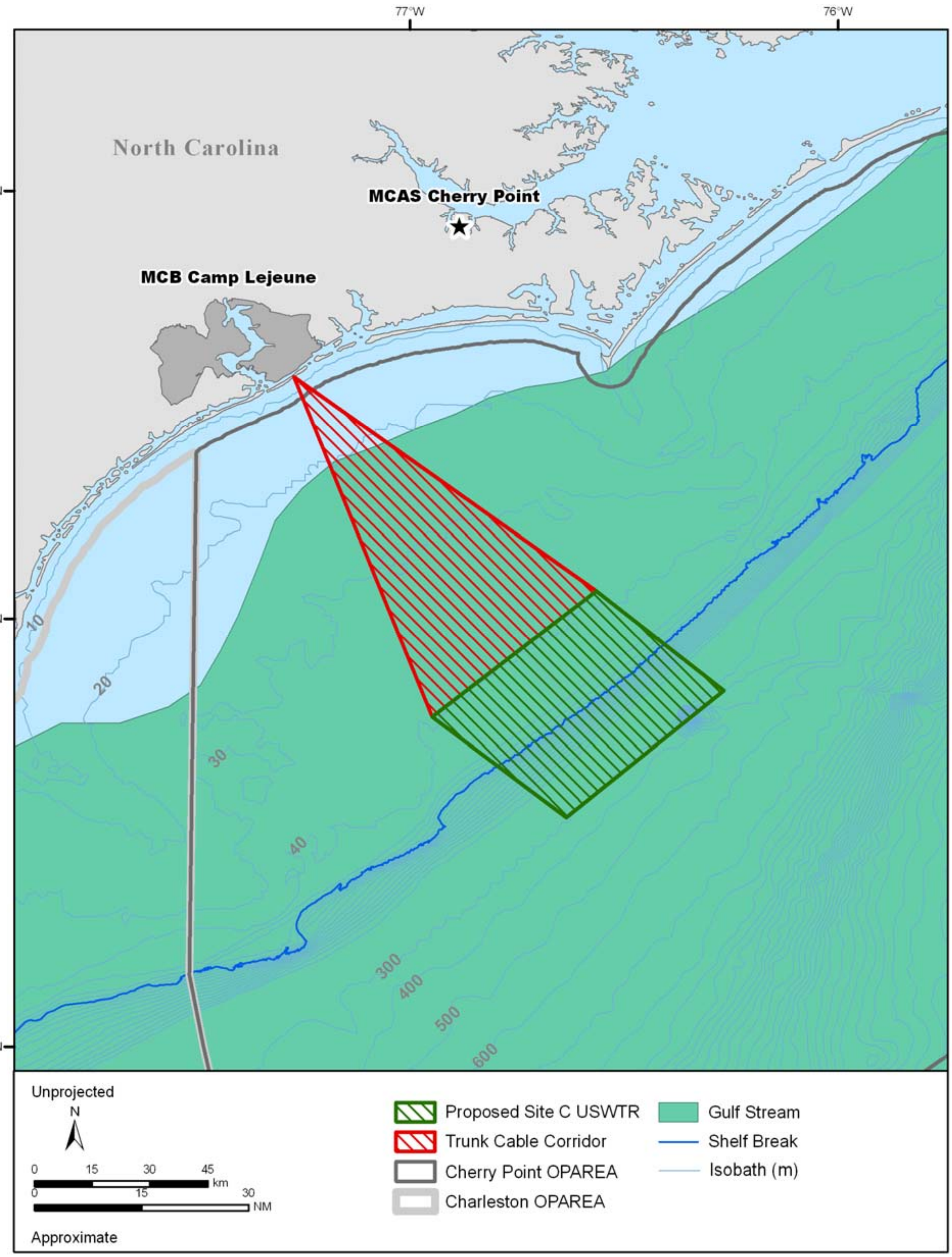

Figure 1-11. Location of currents as essential fish habitat (EFH) within the proposed Site C (Cherry Point) Undersea Warfare Training Range (USWTR) and corresponding trunk cable corridor, and surrounding Cherry Point Operating Area (OPAREA). Source data: SAFMC (2008).

tidal freshwater; estuarine emergent vegetated wetlands (flooded salt marshes, brackish marsh, and tidal creeks); SAV; oyster reefs and shell banks; soft sediment bottom, hard bottom, ocean high salinity surf zones, artificial reefs, and estuarine water column (SAFMC 1998). In the corridor the nearshore habitat EFH is made up of estuaries and coastal embayments, wetlands, water column, oyster reefs, and hard bottom (Street et al. 2005).

- **HAPC**

  Range ─ Of the 1,639 km^2 (478 NM^2) of habitat in the range, surface waters are designated as HAPC when *Sargassum* is present (Figure 1-12; Table 1-2). Twenty-five of the 56 species of fish and invertebrates encompassing four MUs use this area as HAPC (Table A-5). HAPC are a subset of EFH and are areas of concern due to important ecological functions, the rarity of the habitat, the presence of stressful influences from man (e.g., trawling), or the sensitivity of the habitat to human-induced degradation (NMFS 2002a). Within the range, hermatypic corals (*L. pertusa*) form biogenic reefs and are designated as benthic HAPC, and pelagic *Sargassum* (the most common HAPC) provides spawning habitat for multiple MU species (i.e., snapper-grouper).

  Corridor ─ Of the 1,835 km^2 (535 NM^2) of habitat in the corridor, surface waters are designated as HAPC when *Sargassum* is present (Figure 1-12; Table 1-2). HAPC have been designated for 30 species of fish and invertebrates in seven MUs (see Table A-6). HAPC in the corridor like the range consist of multiple habitats including live/hard bottom communities used for spawning by members of the snapper-grouper complex (benthic HAPC) and pelagic *Sargassum* (surface HAPC).

1.1.5 Site D—VACAPES

- **Benthic Substrate EFH (not including live/hard bottom substrate)**

  Range – There are 1,591 km^2 (464 NM^2) in the range, all of which (100%) is designated as benthic substrate EFH (excluding live/hard bottom substrate) because 26 of the 48 species of fish and invertebrates encompassing 12 MUs use this area as EFH (Figure 1-13; Tables 1-2 and A-7). Benthic substrates defined as EFH consist of soft unconsolidated sediments such as gravel, cobbles, pebbles, sand, clay, mud, silt, and shell fragments as well as the water-sediment interface directly above the bottom substrate. Most benthic substrates in the range originated from rivers, glaciers, terrigenous and submarine outcrops of older rocks, and biogenic productivity (Tucholke 1987). Due to the high-energy current and tidal systems that pass over the shelf in the range, sediments are swept off the shelf into deeper water (i.e., slope) (Riggs et al. 1998). The sediments on the shelf within the range consist mostly of quartz and feldspar and increase in grain size closer to the shelf break (Hollister 1973; Tucholke 1987; USGS 2000). In addition, there is very little calcium carbonate (5%) mixed in with the sand on the shelf. Farther offshore on the slope, there is an accumulation of silty clay (Tucholke 1987).

  Corridor – There is 1,480 km^2 (431 NM^2) in the corridor, all of which (100%) is designated as benthic substrate EFH (excluding live/hard bottom substrate) because 19 of the 39 species of fish and invertebrates encompassing nine MUs use this area as EFH (Figure 1-13; Tables 1-2 and A-8). benthic soft substrates within the corridor are composed of the same unconsolidated material found in the range but have greater amounts of finer grained silts and clays closer to shore (e.g., in shoal areas) created from tidal currents (Hollister 1973; Tucholke 1987; USGS 2000). Overall, the benthic soft sediments found in the corridor are finer grained primarily due to erosion and resuspension induced by the Gulf Stream Current, as well as storms, that redistribute and bottom sediments shoreward (Tucholke 1987).

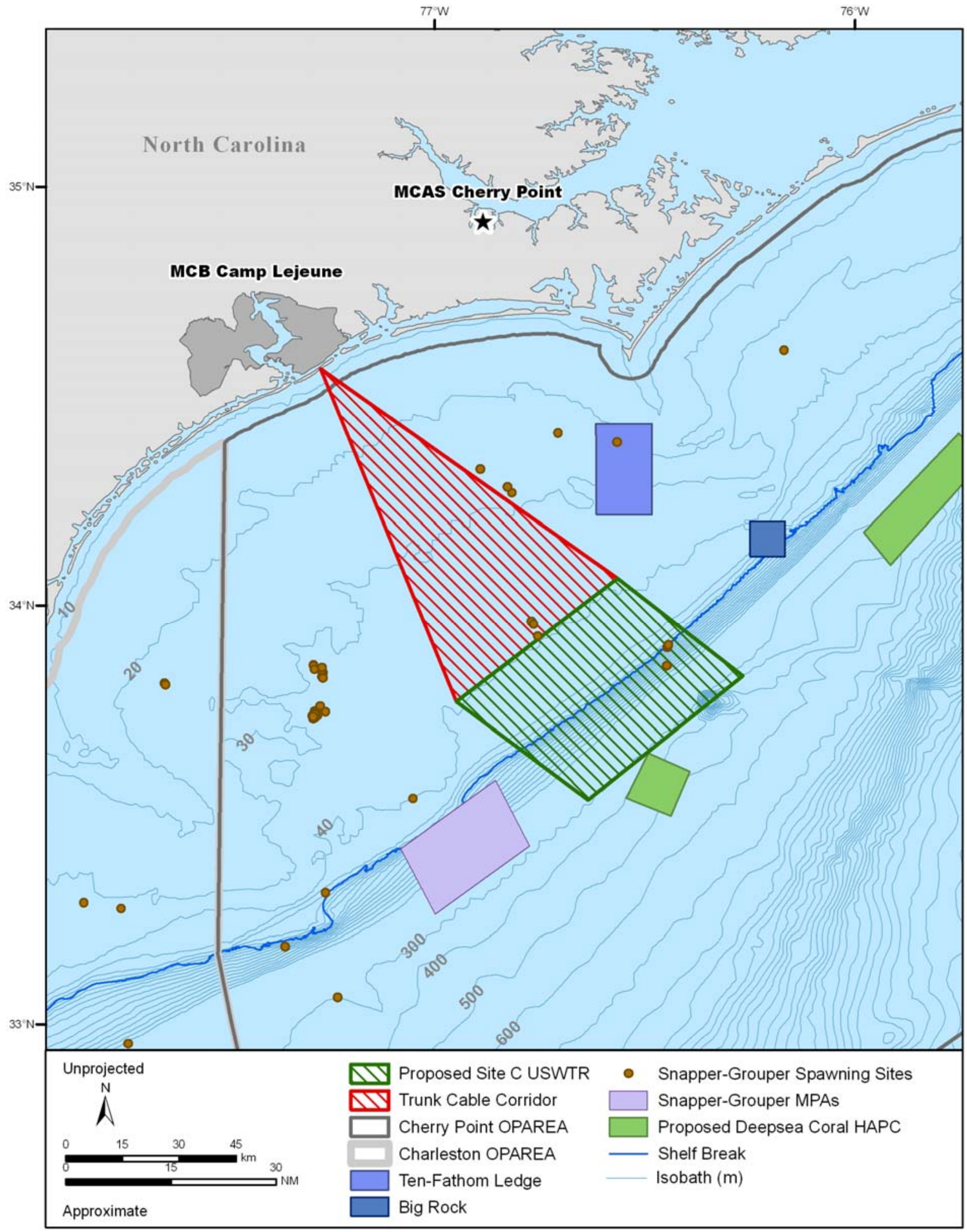

Figure 1-12. Location of surface waters and known benthic substrates (including biogenic reef communities) as habitats of particular concern (HAPC) within the proposed Site C (Cherry Point) Undersea Warfare Training Range (USWTR) and corresponding trunk cable corridor, and surrounding Cherry Point Operating Area (OPAREA). Source data: GDAIS (2005); Sedberry (2005).

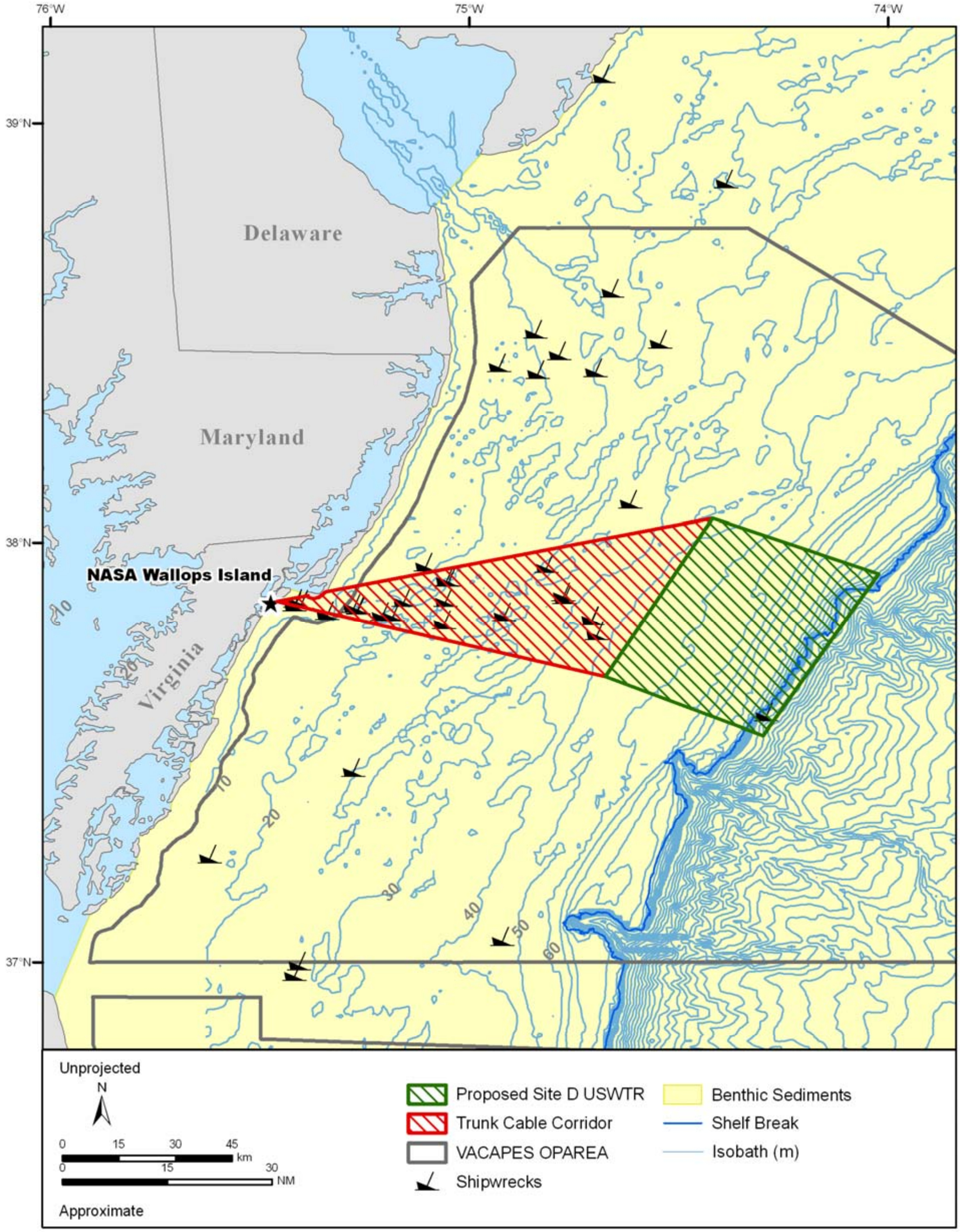

Figure 1-13. Location of benthic substrate and known live/hard bottom (shipwrecks) essential fish habitat (EFH) within the proposed Site D (VACAPES) Undersea Warfare Training Range (USWTR) and corresponding trunk cable corridor, and surrounding VACAPES Operating Area (OPAREA). Source data: Veridian Corporation (2001); NOAA (2004); NAVO (2006).

- **Live/Hard Bottom EFH**

  Range ─ Live/hard bottom EFH in the range exists only in the form of shipwrecks (Figure 1-13), which are considered by the MAFMC to EFH for various species (e.g., black sea bass) (Hoff 2006; Veridian 2001; NCDMF 2005; Hoff 2006). Twelve of the 48 species of fish and invertebrates encompassing eight MUs use this habitat as EFH (Table A-7). The extent or locations of natural hard bottom are unavailable in the sediment data for the VACAPES region (Amato 1994; USGS 2000; NAVO 2006), and the MAFMC could not provide any information on the location of natural hard bottom EFH in the region (Hoff 2006). The natural hard bottom found outside the range can include rocks and boulders or outcroppings of hard rock that may serve as attachment surfaces for organisms such as corals, sponges, or other benthic invertebrates or algae (Reid et al. 2005; Hoff 2006).

  Corridor ─ Live/hard bottom EFH in the corridor exists in the form of shipwrecks (Veridian 2001) (Figure 1-13). Seven of the 39 species of fish and invertebrates encompassing six MUs use shipwrecks as hard bottom EFH (Table A-8). The extent or locations of natural hard bottom are unavailable in the sediment data for the VACAPES region (Amato 1994; USGS 2000; NAVO 2006), and the MAFMC could not provide any information on the location of natural hard bottom EFH in the region (Hoff 2006). The natural hard bottom found outside of the corridor can include rocks and boulders or outcroppings of hard rock that may serve as attachment surfaces for organisms such as corals, sponges, or other benthic invertebrates or algae, although this is not depicted in Figure 1-13 (Reid et al. 2005; Hoff 2006).

- **Artificial Reef EFH**

  Range─ There are no known artificial reefs in the range.

  Corridor – The total area of the corridor is 1,480 km^2 (431 NM^2), and within that area there are five artificial reef complexes designated as EFH (Figure 1-14; Table 1-2) because one of the 39 species of fish and invertebrates encompassing one MU use this area as EFH (Table A-8). The Virginia Marine Resources Commission (VMRC) maintains the artificial reef program in Virginia waterways. The five artificial reefs in the corridor are composed of various materials such as railway cars and military vehicles. Because of the relatively featureless topography in this area, artificial reefs attract commercially important fish species (Steimle and Zetlin 2000).

- **Pelagic *Sargassum* EFH**

  Range ─ All of the 1,591 km^2 (464 NM^2) of the range could potentially contain pelagic *Sargassum* at any given time (Table 1-2). Three of the 52 species of fish and invertebrates encompassing one MU uses this area as EFH (Table A-7). Pelagic *Sargassum* has the potential to occur throughout the entire range but is not always present since its distribution is dependent on surface currents prevailing winds. *Sargassum* aggregates into floating mats called forming windrows that align in strips with the Gulf Stream Current, which acts a conveyor belt for many species of fish and invertebrates (Dooley 1972; Butler et al. 1983). The temperature requirements for *Sargassum* change seasonally, but range from 15°C in the winter to 28°C in the summer months (Garrison 2004). *Sargassum* also has high light requirements, and tolerates salinities between 35 and 36 psu (Hanisak and Samuel 1987; Garrison 2004). *Sargassum* is most abundant in the late fall after its summer growth period (Butler et al. 1983).

  Corridor ─ All of the 1,480 km^2 (431 NM^2) of the corridor could potentially contain pelagic *Sargassum* at any given time (Table 1-2). Three of the 39 species of fish and invertebrates encompassing one MU uses this area as EFH (Table A-8). Pelagic *Sargassum* in the corridor provides the same opportunities for fish and invertebrates as it does within the range and requires the same environmental parameters to survive (see above). In the corridor, *Sargassum* not only aligns itself along the western edge of the Gulf Stream but it also forms windrows under the influence of surface currents created by

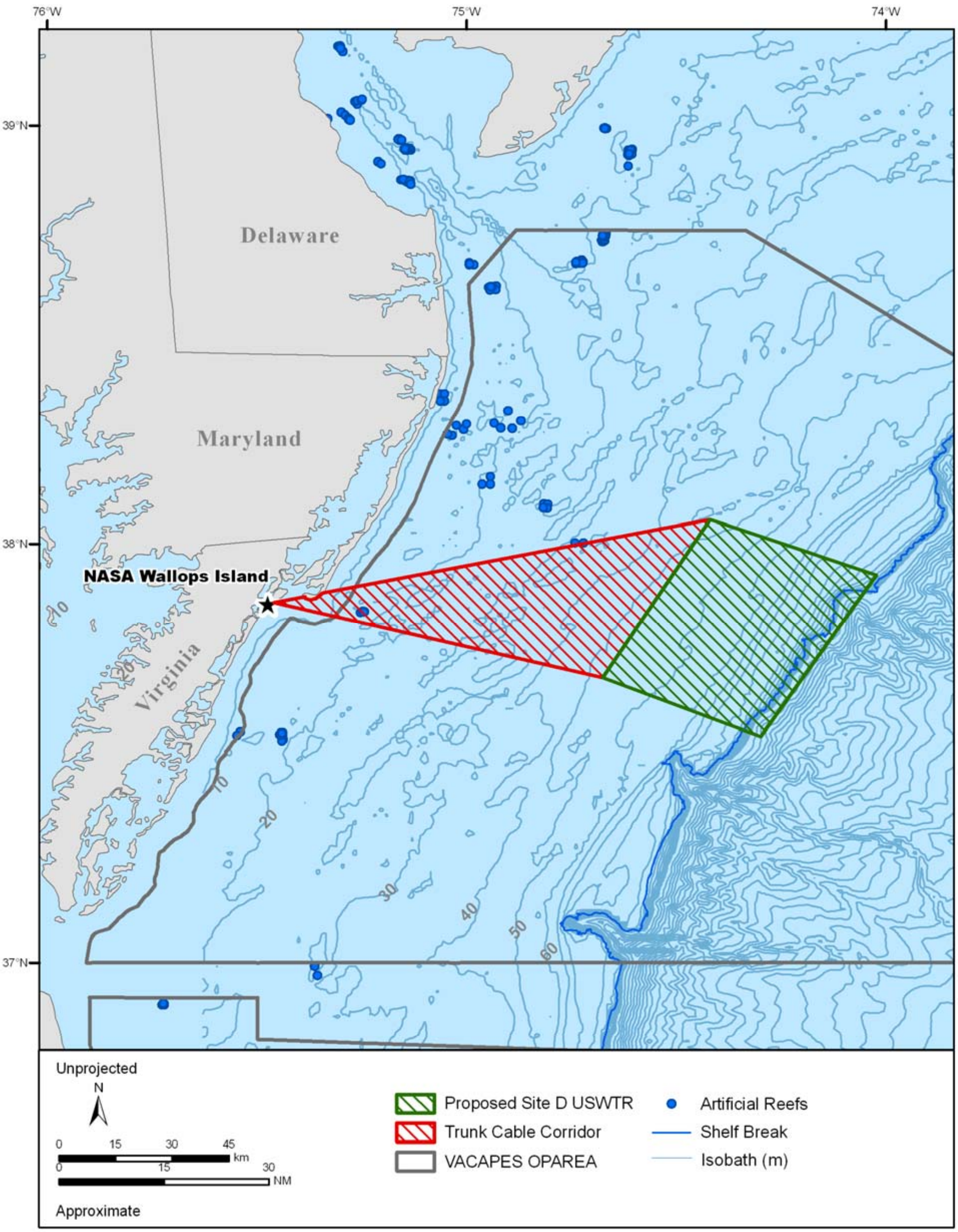

Figure 1-14. Location of artificial reefs as essential fish habitat (EFH) within the proposed Site D (VACAPES) Undersea Warfare Training Range (USWTR) and corresponding trunk cable corridor, and surrounding VACAPES Operating Area (OPAREA). Source data: VMRC (2002).

prevailing winds, and it commonly found washed up on beaches in the region (Butler et al. 1983). *Sargassum* is most abundant in the late fall after its summer growth period (Butler et al. 1983).

- **Water Column EFH**

Range ─ All (100%) of the water column in the 1,591 km^2 (464 NM^2) range is designated as EFH (Table 1-2), because 38 of the 48 species of fish and invertebrates encompassing 16 MUs use this area as EFH (Table A-7). The water column can be described as three layers: a surface water layer extending to about 100 m (329 ft), a thermocline layer, and a deepwater layer extending from the bottom of the thermocline to the seafloor (Schmitz et al. 1987). The water column in the range extends from about 40 to 402 m (131 to 1,329 ft) and circulation in the water column is controlled by both wind and water density, with wind-driven circulation dominating in the upper 100 m (329 ft) (Schmitz et al. 1987). Below the thermocline circulation is controlled through differences in water density which influence the thermocline and create vertical circulation transporting nutrients and organisms to the surface when mixing is strong (Schmitz et al. 1987).

Plankton are organisms found throughout the water column in the range. They are at the base of the oceanic food web and drift with the currents in the water column and provide nutrition for many commercially important fish species (Parsons et al. 1984). The water column is also a popular spawning ground for many different fish species such as species in the Atlantic herring MU. The water column in the range also supports different lifestages of species in the Atlantic Billfish MU as well as species in the Atlantic Tuna, Swordfish, and Shark MUs (Table A-7).

Corridor ─ All (100%) of the water column in the 1,480 km^2 (431 NM^2) corridor is designated as water column EFH (Table 1-2), because 28 of the 39 species of fish and invertebrates encompassing 15 MUs use this area (Table A-8). The main difference between the water column habitat in the range and the corridor is the depth of the water column in the corridor which extends from ~ 40 to < 1 m (~ 131 to < 3 ft) and is subject to greater seasonal fluctuations in temperature and salinity.

The water column in the corridor is also a popular spawning ground for several species in the Northeast Multispecies MU, because of its dynamic properties (i.e., mixing properties, temperature fluctuations, and proximity to nearshore estuaries and bays).

- **Nearshore Habitat EFH**

Range ─ There is no nearshore habitat designated as EFH in the range.

Corridor ─ Three percent of the corridor is designated as nearshore EFH (Table 1-2), because 26 of the 39 species of fish and invertebrates have designated EFH in the corridor encompassing 14 MUs (Table A-8). All nearshore habitats are considered EFH. Nearshore habitats are found in state waters and include a variety of habitats such as water column, benthic substrates, vegetated estuarine habitats, coastal inlets, state designated nursery habitats, and structures such as piers and bridges. The nearshore habitat in the corridor consists of coastal bays and wetlands that support abundant juvenile fish and shellfish (Wazniak et al. 2004; MDNR 2006). Chincoteague Bay is located along the eastern shore of Virginia and Maryland within the Assateague barrier island chain and supports numerous seagrass beds, salt marshes, and wetlands, which shelter various lifestages of fish and shellfish species (Wazniak et al. 2004).

- **HAPC**

Range ─ There are no HAPC designations within the range.

Corridor ─ There are no HAPC designations within the corridor.

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2.0 IMPACTS ON ESSENTIAL FISH HABITAT

When possible, EFH impacts specific to either the range or cable corridor for each of the proposed action sites are specified. If not so noted, impacts would be relevant for only the proposed range site.

2.1 Factors Used to Assess Effects

This EFH Assessment analyzes potential effects on EFH in the context of the MSA and implementing regulations. Pursuant to 50 CFR 600.910(a), an “adverse effect” on EFH is defined as any impact that reduces the quality and/or quantity of EFH. To help identify Navy activities falling within the adverse effect definition, the Navy has determined that temporary or minimal impacts are not considered to “adversely affect” EFH. 50 CFR 600.815(a)(2)(ii) and the EFH Final Rule (67 Fed. Reg. 2354) were used as guidance for this determination, as they highlight activities with impacts that are more than minimal and not temporary in nature, as opposed to those activities resulting in inconsequential changes to habitat. Temporary effects are those that are limited in duration and allow the particular environment to recover without measurable impact (67 Fed. Reg. 2354). Minimal effects are those that may result in relatively small changes in the affected environment and insignificant changes in ecological functions (67 Fed. Reg. 2354). Whether an impact is minimal depends on a number of factors:

- The intensity of the impact at the specific site being affected;
- The spatial extent of the impact relative to the availability of the habitat type affected;
- The sensitivity/vulnerability of the habitat to the impact;
- The habitat functions that may be altered by the impact (*e.g.,* shelter from predators); and
- The timing of the impact relative to when the species or life stage needs the habitat.

The analysis of effects on EFH as they relate to the size of the range (square NM) identified under each alternative are based on Navy’s current understanding of each of the proposed range sites. The final size of the range may be larger or smaller than the figures in this assessment after hydrographic surveys are completed and the final range design is developed after taking into consideration environmental conditions at the site. Navy expects the final range size to be approximately 500 square nautical miles.

2.2 Installation of Range Instrumentation

Range instrumentation would include interconnect cable, trunk cable, junction box, and transducer nodes. The interconnect cable between each node and the trunk cable connecting the range to the shore facility would be buried to a depth of approximately 1 m (3 ft). The buried trunk cable would be comprised of two segments, one of which would buried to connect the shore to a junction box, located 25 km (14 NM) from shore (the junction box would not be buried) while the second segment would connect the first junction box to a second located at the edge of the range. The interconnect cable could be buried between each transducer node within the range. The burial of the interconnect cable will be decided based upon the level of bottom fishing activity. Ocean-bottom burial equipment would be used to cut (hard bottom) or plow (soft sediment) a furrow approximately 10 cm (4 in) wide in which the 5.8 cm (2.3 in) diameter cable would be placed. The path of the burial equipment is expected to be approximately 5 m (16 ft) wide, resulting in an approximately 920,000 square meters (m^2) (8,841,200 square feet [ft^2]) area of impact. An area of impact analysis is used to estimate the potential impacts on each of the EFH types found at each of the four sites below. The Department of the Navy (Navy) is currently sponsoring the mapping of the seafloor in the preferred alternative, Site A, and its associated trunk cable corridor. The seafloor mapping will probably continue into 2010. Seafloor mapping products will be used such that the installation of range instrumentation avoids sensitive habitats to the greatest extent possible.

It should be noted that additional permits specific to the chosen site may be required in order for the installation of the USWTR to proceed. Any subsequent permits may require a more detailed, site-specific analysis of potential impacts on EFH that could occur from the installation process. Should any additional permits require, a site specific analysis of EFH impacts would be provided, including such details as the precise locations of the trunk cable, shore facility, and transducer nodes, as well as the specific habitat types in those locations.

2.2.1 Site A—Jacksonville

- **Impacts on Benthic Substrate EFH (not including live/hard bottom)**

  Range – Placement of the 300 transducer nodes and burying of the interconnect cables (1,110 km [600 NM] in length) in the range has the potential to impact benthic substrate EFH within the vicinity of the proposed USWTR Site A. The benthic substrates within the range that appear along the outer continental shelf and along the shelf break (~ 40 to 100 m [~ 131 to 328 ft]) are mostly medium to fine grain carbonate sediments. These sediments make up between 50% and 95% of the sediments on the outer Florida-Hatteras shelf and the adjacent Florida-Hatteras slope (Jones et al. 1985; Emery and Uchupi 1972). Farther seaward on the Blake Plateau, between 85% and 93% of sediments are composed of carbonate (Emery and Uchupi 1972; Jones et al. 1985).

  Benthic substrate EFH (not including live/hard bottom) would be disturbed during the installation by burial of the interconnect cables. As a conservative estimate, the maximum area of soft bottom substrate potentially impacted by the interconnect cable is 5.55 km^2 (1.62 NM^2). Each transducer node would cover approximately 5 m^2 (54 ft^2) of soft substrate totaling an area for all 300 nodes of about 0.0015 km^2 (0.0004 NM^2). The total area of benthic substrate (not including live/hard bottom) in the range is approximately 935 km^2 (273 NM^2), of which a maximum of only 0.59% would potentially be impacted by the transducers and interconnect cables, assuming that all of the nodes and cables were laid on benthic substrate EFH. This represents a very small area of benthic substrate EFH (not including live/hard bottom) within the proposed USWTR Site A. The installation of range instrumentation and cables at the proposed USWTR Site A may adversely affect, but would not substantially affect, benthic substrate EFH (not including live/hard bottom).

  Corridor – Burial of the trunk cable may impact benthic substrate EFH within the vicinity of the proposed USWTR Site A. The two junction boxes used to connect the trunk cables would not be buried, but the placement of the boxes would impact the benthic substrate EFH by permanently covering the habitat. During the burial process a 10 cm (4 in) wide, 1 m (3 ft) deep furrow would be trenched to bury the 5.8 cm (2.3 in) diameter trunk cable using equipment that is approximately 5 m (16 ft) in width. The furrow may temporarily displace benthic species and disturb benthic substrate EFH to a depth of 1 m (3 ft). As a conservative estimate, the maximum area of benthic substrate EFH (not including live/hard bottom) that may be impacted by the burial equipment, assuming that all of the trunk cable is buried in benthic substrate EFH, is approximately 0.47 km^2 (0.14 NM^2). This represents a relatively small amount (0.03%) of benthic soft substrate within the Site A corridor. As a result, the installation of the trunk cable from shore to the proposed USWTR Site A may adversely affect, but would not substantially affect, benthic substrate EFH (not including live/hard bottom).

- **Impacts on Live/Hard Bottom Substrate EFH**

  Range – Known locations of live/hard bottom substrate within the USWTR at Site A have been partially mapped (Figure 1-1). During installation, seafloor mapping products will be used such that the installation of range instrumentation (including transducer nodes) avoids sensitive habitats to the greatest extent possible. Burying of the interconnect cables (1,110 km in length [600 NM]) in the range could potentially impact hard bottom within the vicinity of the proposed USWTR Site A by crushing and cutting through hard bottom substrate. This action would affect hard bottom EFH and disturb benthic EFH species. The rock ridge system that exists along the shelf break in the vicinity of Site A supports benthic EFH species and would be impacted if the interconnect cables traverse the ridge.

Alternatively, laying the interconnect cable directly onto the seafloor would eliminate the initial disruption to live/hard bottom EFH associated with the cable burying process. Although, longer term impacts on hard bottom from cable chafing or scouring may occur. An interconnect cable overlaying an area (or areas) of hard bottom will be subject to bottom currents, slumping of the seafloor, or other forces which may induce the cable to shift and may result in chafing or scouring of hard bottom (Kogan et al 2003). Cables suspended above the seafloor between two areas of hard bottom substrate have been known to carve grooves over time into the hard bottom at the suspension points and may result in fraying or other damage to the cable at those points (Kogan et al. 2003). There is, however, the potential for unburied cables to provide points of attachment for marine fauna, ultimately allowing benthic communities that require hard substrate to expand beyond the extent of naturally occurring hard bottom (ONR 2001; Kogan et al. 2003). On the other hand, significant slumping events have been known to cause communications cables, similar to the interconnect cables, residing on the seafloor to break (Emery and Uchupi 1972). In addition to the interconnect cables, the placement of the transducer nodes on live/hard bottom habitat would adversely impact the organisms colonizing the direct area of the nodes.

As a conservative estimate, the maximum area of live/hard bottom substrate potentially impacted by the interconnect cables and the nodes, assuming that all of the nodes and cables were laid on live/hard bottom, is 5.55 km^2 (1.62 NM^2). This represents a small amount (about 0.92%) of the known live/hard bottom substrate EFH within the proposed USWTR Site A. The installation of range instrumentation at the proposed Site A may adversely affect live/hard bottom EFH present in the range.

<u>Corridor</u> – Burial of the trunk cable may impact live/hard bottom EFH within the vicinity of the proposed USWTR Site A. The junction boxes used to connect the trunk cables would not be buried and may impact hard bottom EFH by crushing or covering it. Other impacts would occur to hard bottom EFH benthic species (i.e., mollusks) residing in the area to be trenched to accommodate the proposed burial of the 5.8 cm (2.3 in) diameter cable. Although the furrow would be 10 cm (4 in) wide with a depth of approximately 1 m (3 ft), the burial equipment used to cut through the hard bottom substrate and dig the furrow would be 5 m (16 ft) wide and may kill or displace benthic species and damage live/hard bottom EFH. Approximately 197 km^2 (9 NM^2) of hard bottom EFH exists in the trunk cable corridor for Site A. As a conservative estimate, about 0.47 km^2 (0.14 NM^2) of live/hard bottom EFH could be disturbed if the trunk cable were buried along a path consisting entirely of live/hard bottom substrate. This represents a very small amount (about 0.23%) of the known live/hard bottom EFH within the Site A corridor. Given the relative small amount of live/hard bottom in the corridor, it should not be difficult to avoid these areas when laying the trunk cable from shore out to the range. Therefore, the installation of the instrumentation and trunk cable in the Site A corridor may adversely affect, but would not substantially affect, live/hard bottom EFH.

- **Impacts on Artificial Reef EFH**

<u>Range</u> – No artificial reefs are designated as EFH in the vicinity of the proposed USWTR Site A; therefore, no adverse effects on artificaial reef EFH would occur.

<u>Corridor</u> – One hundred six artificial reefs, which are designated as EFH, are found in the vicinity of the proposed USWTR Site A. If artificial reefs are encountered during the installation process, the installation plan would be altered to avoid disturbing or otherwise impacting any artificial reefs. Therefore, the installation of the trunk cable from shore to the proposed USWTR Site A would not adversely affect artificial reef EFH.

- **Impacts on Pelagic *Sargassum* EFH**

  Pelagic *Sargassum* can occur in all four proposed USWTR sites and provides EFH for several fish species, particularly the larval lifestage. The exact location of *Sargassum* at any given time within each site is impossible to predict. However, since pelagic *Sargassum* is found floating at the sea surface often at the convergence of surface currents and is not associated with the benthic environment, no impact on pelagic *Sargassum* EFH is anticipated from the installation of range instrumentation on the seafloor. Any disturbance to *Sargassum* by surface equipment (e.g., ships) required to perform the installation would be temporary and would not differ significantly from other maritime traffic occurring in the region. No adverse impacts on pelagic *Sargassum* EFH are expected in either the range or the corridor from the installation of range instrumentation at the proposed USWTR Site A.

- **Impacts on Water Column EFH**

  Range – One hundred percent of the water column is designated as EFH in both the proposed USWTR Site A and the adjacent trunk cable corridor (Table 1-2). A localized increase in turbidity within the water column is anticipated near the seafloor during construction of the range. The placement of approximately 300 transducer nodes, each covering 5 m^2 (54 ft^2) of soft sediment, would likely result in a localized increase in turbidity in the vicinity of the placement sites. The interconnect cable linking the nodes is expected to be buried throughout the range at Site A. The equipment used to excavate the furrow for the cable should generate a significant amount of turbidity from displaced sediments entrained into the water column in the immediate vicinity of the burial equipment; however, deepwater or bottom-layer ocean currents in the vicinity of the range should quickly disperse sediments stirred-up into the water column and return water column turbidity to pre-installation levels shortly after the installation of range instrumentation is complete. Therefore, the installation of the nodes and cables in USWTR Site A would not adversely affect water column EFH.

  Corridor – A localized increase in turbidity within the water column is also anticipated, near the seafloor during the process of burying the trunk cable that connects the proposed USWTR Site A to the shore facility. The expected increase in turbidity may occur throughout larger sections of the water column or throughout the entire the water column at shallower depths closer to shore. The surface currents and tidal fluctuations in the vicinity of the trunk cable corridor should quickly disperse sediments stirred-up into the water column and return water column turbidity to pre-installation levels shortly after the process of burying the trunk cable is complete. The installation of the trunk cable from shore to the proposed USWTR Site A would not adversely affect water column EFH.

- **Impacts on Currents EFH**

  Surface currents and other circulation features (e.g., gyres) occur at varying spatial and temporal scales throughout the region; however, the most dominant oceanographic feature in the region is the Gulf Stream. The Gulf Stream is a dynamic feature that undergoes constant fluctuations in its physical properties, including its spatial dimensions. The entire USWTR Site A and 69% of the corridor overlap with the Gulf Stream (Figure 1-3; Table 1-2). Installation of range instrumentation should not impact EFH associated with the Gulf Stream since none of the proposed activities are at a sufficient scale to significantly impede or disturb the Gulf Stream or to reduce its suitability as EFH. Therefore, the installation of the instrumentation and cables in USWTR Site A and along the corridor would not adversely affect currents EFH.

- **Impacts on Nearshore EFH**

  A very small area of nearshore EFH would be impacted by the process of burying the trunk cable that connects the USWTR with the shore facility at each of the four proposed sites. For the purposes of this EFH assessment, nearshore marine habitat is defined as those waters within 5.6 km (3 NM) of the shoreline (i.e., state waters) and encompasses only the most shoreward section of the trunk cable corridor. This dynamic environment provides important habitat for the majority of fish and invertebrate species with EFH in the region.

To bury the trunk cable, a 10 cm (4 in) wide trench would be excavated to a depth of about 1 m (3 ft) using equipment that is approximately 5 m (16 ft) wide. The area of nearshore EFH within the trunk cable corridor for Site A is approximately 7 km^2 (2 NM^2) (Table 1-2). The maximum area potentially impacted in the process of burying the trunk cable is estimated as a 5 m (16 ft) wide path extending along the edge of the corridor (the longest possible distance) and represents only about 0.43% (0.03 km^2 [0.01 NM^2]) of the nearshore EFH within the corridor (Appendix B). This is a conservative estimate of the impact area because the cable is likely to traverse a shorter distance closer to the middle of the nearshore corridor, which would reduce the area impacted by the burial process.

Impacts on soft benthic substrate EFH in the nearshore corridor associated with burying the trunk cable should be minimal and temporary. After the cable is buried, soft sediments and tidal habitat should revert to pre-installation conditions in a relatively short period of time (Street et al. 2005). A study summarizing the recovery of intertidal (as well as other) habitats following disturbance by fishing activity (e.g., dredging and raking) noted that recovery of unconsolidated bottom habitat (without vegetation) occurred in six months to one year (in most cases), but that some habitats, including those with a biogenic component, took as long as two years (Collie et al. 2000). The study demonstrated that repeated disturbance to the same area increased recovery times (Collie et al 2000).

In general, nearshore habitats are dynamic environments subject to constantly changing physical conditions and the flora and fauna that thrive in these environments are often resilient and able to respond and regenerate relatively quickly (~months to years rather than decades) to disturbances (Collie et al. 2000). Full regeneration of a disturbed habitat will be dependent on many factors; however, some of the more consistently critical ones include the size of the disturbance, frequency of subsequent or repeated disturbances, time of year the disturbance occurs, and the presence of other stressors (Allison 1995; Collie et al. 2000; Kaiser et al. 2002).

The turbidity of nearshore waters is likely to increase during the cable burying process, which could impact nearshore EFH by reducing light availability throughout the water column and increasing sedimentation in areas that typically experience low sediment deposition. These impacts would only be temporary as substrate material stirred-up into the water column would be dispersed by nearshore currents and tidal fluctuations. A project similar to this one involving the burial of a fiber optic communications cable in Chesapeake Bay was evaluated for its environmental effects, and it was determined that no significant impacts on the nearshore benthic habitat would result (DoN 2005). Because of the transient nature of the potential impacts, the installation of the trunk cable along the corridor may adversely affect, but would not substantially affect, nearshore EFH.

- **Impacts on HAPC**

HAPC within the proposed USWTR Site A and the adjacent trunk cable corridor consists primarily of live/hard bottom community EFH identified as snapper-grouper spawning locations and pelagic *Sargassum* EFH (Figure 1-6). The first habitat type is benthic HAPC and the second is limited to surface waters. The potential impacts on each of these two habitats have been assessed previously (see sections above).

Based on the previous discussion, the installation of the instrumentation and cables both on the USWTR Site A and within the corridor would not adversely affect *Sargassum* HAPC (see section above). Potential impacts on benthic HAPC are described below.

<u>Range</u> – The approximately 300 transducer nodes planned for installation would not be placed on any hard bottom (live or otherwise). The interconnect cables linking the transducers would be buried at the proposed USWTR Site A. Burial of the interconnect cables (totaling 1,110 km [600 NM] in

length) on the seafloor may impact live/hard bottom substrate and communities designated as HAPC (medium to high offshore hard bottom where spawning in species of the snapper-grouper complex occurs, other known spawning locations, and hermatypic coral habitats and reefs) located within the range by displacing or cutting through the hard bottom substrate or communities. Burying the interconnect cables would likely require cutting through at least some hard bottom, given that approximately 600 km^2 (175 NM^2) or 39% of the benthic EFH in the range is designated as live/hard bottom EFH (Figure 1-1; Table 1-2). Although the area of benthic HAPC is undefined, it is considerably less than the area of live/hard bottom EFH because not all live/hard bottom is designated as HAPC. Nevertheless, disturbing live/hard bottom HAPC may displace EFH species that use this habitat.

The rock ridge system that exists along the shelf break supports benthic EFH species (e.g., snapper-grouper complex) as well as live/hard bottom communities. These areas may be permanently impacted if burying the interconnect cables erodes sections of the ridge system. As a conservative estimate, the maximum area of substrate (including but not limited to benthic HAPC) potentially impacted by the interconnect cable is 5.55 km^2 (1.62 NM^2). This represents a very small amount (about 0.92%) of known live/hard bottom substrate within the proposed USWTR Site A. Not all hard bottom is designated as HAPC EFH (Figure 1-4), so the benthic HAPC potentially impacted would be far less. Despite that fact, due to the potentially long-term nature of any potential disturbance, the installation of the instrumentation and cables in USWTR Site A may adversely affect benthic HAPC.

Corridor – No benthic habitats designated as HAPC occur within the trunk cable corridor (Figure 1-4). Therefore, the installation of the trunk cable along the corridor from shore to the USWTR Site A would not adversely affect benthic HAPC.

2.2.2 Site B—Charleston

- **Impacts on Benthic Substrate EFH (not including live/hard bottom substrate)**

Range – The unconsolidated bottom sediments found in the vicinity of the proposed USWTR Site B are described in Chapter 1 and depicted in Figure 1-5 (Benthic Substrate EFH [not including live/hard bottom substrate]). The benthic substrate found in the range is composed primarily of quartzite or calcium carbonate (25% to 75%) sand (Hollister 1973; Amato 1994; USGS 2000). In addition to the dominant sandy substrate, the range sits directly over areas of sand or silty clay, clayey or silty sand, and an area of equal parts sand, silt, and clay (Amato 1994; Tucholke 1987; USGS 2000). The percentage of calcium carbonate in the sediments increases from between 25% and 75% to greater than 75% over Blake Plateau, which overlaps with the southeastern half of the range.

Placement of the 300 transducer nodes and the burying of the interconnect cables (1,110 km in length [600 NM]) in the range has the potential to impact benthic substrate EFH within the vicinity of the proposed USWTR Site B. Although the transducer nodes would not be buried, the interconnect cables spanning the distance between each transducer would be buried. The process of burying the cables would overturn and disturb benthic substrate EFH and benthic species that reside in this area (Wallace 2006). As a conservative estimate, the maximum area of benthic substrate (not including live/hard bottom substrate) potentially impacted by the interconnect cable, assuming the entire cable was laid in benthic substrate, is 5.55 km^2 (1.62 NM^2) (see Figure 1-5). In addition, each individual transducer node would cover approximately 5 m^2 (54 ft^2) of soft substrate, resulting in a total area of impact of about 0.0015 km^2 (0.0004 NM^2) for 300 transducers (Appendix B). The total area of impact (interconnect cables and transducer nodes combined) to benthic substrate EFH (not including live/hard bottom) is estimated to be 5.55 km^2 (1.62 NM^2).

The total area of benthic substrate (not including live/hard bottom) in the range is approximately 1,285 km^2 (375 NM^2), of which only 0.43% would be impacted by the transducers and interconnect cables. This represents a very small area of benthic substrate EFH (not including live/hard bottom) within the proposed USWTR; therefore, the installation of the range instrumentation and cables at the proposed USWTR Site B may adversely affect, but would not substantially affect, benthic substrate EFH (not including live/hard bottom).

Corridor – The unconsolidated sediments in the Site B trunk cable corridor consist of soft sediments such as gravel and sand. Burial of the trunk cable has the potential to impact benthic substrate EFH within the vicinity of the proposed USWTR Site B. The bottom substrate in the vicinity of Site B consists primarily of sand with small areas of sandy/clayey silt, clayey/silty sand, and sand/silt/clay (USGS 2000). Benthic substrates are formed into numerous shoals that are scattered throughout the corridor and also support a number of benthic species. Digging or plowing a furrow through these shoals to lay the trunk cable may displace benthic species that depend on the varying topography and could possibly alter water flow in the area, temporarily impacting other EFH such as water column and currents.

The two junction boxes used to connect the trunk cables would not be buried and may impact benthic substrate EFH permanently by covering or displacing the sediments. Other impacts on benthic EFH could occur in the area to be trenched to accommodate the proposed burial of the 5.8 cm (2.3 in) diameter cable. Although the furrow would be 10 cm (4 in) wide with a depth of approximately 1 m (3 ft), the burial equipment used to dig the furrow would be 5 m (16 ft) wide and may temporarily displace benthic species and benthic substrate EFH. As a conservative estimate, the maximum area of benthic substrate EFH (not including live/hard bottom) that could be impacted by the burial equipment and trunk cable, assuming the entire cable was laid in benthic substrate, is approximately 0.46 km^2 (0.13 NM^2). This represents a minimal amount (0.05%) of benthic substrate (not including live/hard bottom) within the corridor. The installation of the trunk cable from shore to the proposed USWTR Site B may adversely affect, but would not substantially affect,benthic substrate EFH (not including live/hard bottom).

- **Impacts on Live/Hard Bottom EFH**

Range – The locations of known live/hard bottom communities found in the vicinity of the proposed USWTR at Site B are described in Chapter 1 and depicted in Figure 1-5. Live/hard bottom substrate locations within the range were derived from SEAMAP (2001, 2007) data. Burying the interconnect cables (1,110 km [600 NM] in length) in the range could impact live/hard bottom EFH within the proposed USWTR Site B. As the interconnect cables are buried, any hard bottom encountered would be cut through or crushed by the installation equipment, potentially displacing EFH species that use this area.

Alternatively, laying the interconnect cable directly onto hard bottom substrate would eliminate the initial disruption to hard bottom EFH associated with the cable burying process. Although, longer term impacts on hard bottom from cable chafing or scouring may occur. An interconnect cable overlaying an area (or areas) of hard bottom will be subject to bottom currents, slumping of the seafloor, or other forces which may induce the cable to shift and may result in chafing or scouring of hard bottom (Kogan et al 2003). Cables suspended above the seafloor between two areas of hard bottom substrate have been known to carve grooves over time into the hard bottom at the suspension points and may result in fraying or other damage to the cable at those points (Kogan et al. 2003). There is, however, the potential for unburied cables to provide points of attachment for marine fauna, ultimately allowing benthic communities that require hard substrate to expand beyond the extent of naturally occurring hard bottom (ONR 2001; Kogan et al. 2003). On the other hand, significant slumping events have been known to cause communications cables, similar to the interconnect cables, residing on the seafloor to break (Emery and Uchupi 1972). In addition to the interconnect cables, the placement of the transducer nodes on live/hard bottom habitat would adversely impact the organisms colonizing the direct area of the nodes.

Included within the live/hard bottom EFH potentially impacted by this action are deepwater coral reefs composed primarily of the hermatypic coral, *Lophelia pertusa*. These *Lophelia* Reefs, as they are known, are located beyond the shelf break along the seaward boundary of the proposed USWTR Site B (Chapter 1) and are specifically referred to as the Savannah Lithoherms. These slow growing coral reefs are EFH for snapper-grouper species, and are on a proposed list as future HAPC sites (SAFMC 2006a; Figure 1-8). Any damage inflicted on these corals (*Lophelia*) during the installation of range instrumentation could have a long-term and localized significant impact on this habitat because the coral would require decades to centuries to recover (Freiwald et al. 2004; Ross and Nizinski 2007).

As a conservative estimate, the maximum area of live/hard bottom substrate potentially impacted by the interconnect cables and the nodes, assuming that all of the nodes and cables were laid on live/hard bottom, is 5.55 km^2 (1.62 NM^2). This represents a small amount (about 2.98%) of the known live/hard bottom substrate EFH within the proposed USWTR Site B. Although it is unlikely, given the relatively small area disturbed by range installation and the limited availability of live/hard bottom habitat within the range, the installation of the instrumentation and cables at the proposed Site B may adversely affect live/hard bottom EFH present in the range.

<u>Corridor</u> – Burial of the trunk cable could impact hard bottom EFH within the vicinity of the proposed USWTR Site B as some live/hard bottom substrate may be cut through or otherwise displaced in order to lay the trunk cable. The junction boxes used to connect the trunk cables would not be buried and may impact hard bottom EFH by crushing or covering it. Other temporary impacts would occur to benthic species (i.e., mollusks) utilizing live/hard bottom in the area to be trenched to accommodate the proposed burial of the 5.8 cm (2.3 in) diameter cable. Although the furrow for the cable would be 10 cm (4 in) wide with a depth of approximately 1 m (3 ft), the burial equipment used to dig the furrow and cut through the live/hard bottom is 5 m (16 ft) wide and may kill or displace benthic species and damage live/hard bottom EFH. Approximately 270 km^2 (79 NM^2) of live/hard bottom EFH has been located in the trunk cable corridor for Site B. As a conservative estimate, about 0.46 km^2 (0.13 NM^2) of live/hard bottom EFH could be disturbed if the trunk cable were laid along a path consisting entirely of live/hard bottom substrate. Nevertheless, this represents a very small amount (about 0.17%) of known live/hard bottom EFH within the Site B corridor (Appendix B). Because it is highly improbable that the entire furrow would traverse only live/hard bottom substrate, the amount of live/hard bottom affected will be less than the 0.17% estimated above. Given the relative small amount of live/hard bottom in the corridor, it should not be difficult to avoid these areas when laying the trunk cable from shore out to the range. Therefore, the installation of the trunk cable in the Site B corridor may adversely affect, but would not substantially affect, live/hard bottom EFH.

- **Impacts on Artificial Reef EFH**

<u>Range</u> –No artificial reefs are known to be located within the proposed range at Site B. If any previously unknown artificial reefs are encountered during the installation of range instrumentation, the installation plan would be altered to avoid any disturbance to artificial reefs. Therefore, the installation of range instrumentation and cables at the proposed USWTR Site B would not adversely affect artificial reef EFH.

<u>Corridor</u> – Twelve artificial reefs are known to be located within the trunk cable corridor (Table 1-2; Figure 1-6), and all 12 are located in close proximity to each other. The reefs will be avoided during the installation of the trunk cable to the greatest extent practical. Furthermore, if any previously unknown artificial reefs are encountered during the installation of the trunk cable, the installation plan would be altered to ensure that trenching activities avoid disturbing any artificial reefs. Therefore, the installation of the trunk cable in the Site B corridor would not adversely affect artificial reef EFH.

- **Impacts on Pelagic *Sargassum* EFH**

  Pelagic *Sargassum* can occur in all four proposed USWTR sites and provides EFH for several fish species, particularly during the larval lifestage. The exact location of *Sargassum* at any given time within each site is impossible to predict. Since pelagic *Sargassum* is found floating at the sea surface, often at the convergence of surface currents, and is not associated with the benthic environment, no impact on pelagic *Sargassum* EFH is anticipated from the sea-floor installation of range instrumentation. Any disturbance to *Sargassum* by surface equipment (e.g., ships) required to perform the installation would be temporary and would not differ significantly from other maritime traffic occurring in the region. No adverse effects on pelagic *Sargassum* EFH are expected in either the range or the corridor from the installation of range instrumentation at the proposed USWTR Site B.

- **Impacts on Water Column EFH**

  <u>Range</u> – One hundred percent of the water column is designated as EFH in both the proposed USWTR Site B and adjacent trunk cable corridor (Table 1-2). A localized increase in turbidity within the water column is anticipated near the seafloor during construction of the range. The placement of approximately 300 transducer nodes, each covering 5 m^2 (54 ft^2) of soft sediment, would likely result in a localized increase in turbidity in the vicinity of the placement sites. The interconnect cable linking the nodes is expected to be buried throughout the range at Site B. The equipment used to excavate the furrow for the cable should generate a significant amount of turbidity from displaced sediments entrained into the water column in the immediate vicinity of the burial equipment; however, deepwater or bottom-layer ocean currents in the vicinity of the range should quickly disperse sediments stirred-up into the water column and return water column turbidity to pre-installation levels shortly after the installation of range instrumentation. Therefore, the installation of range instrumentation and cables at the proposed USWTR Site B would not adversely affect water column EFH.

  <u>Corridor</u> – A localized increase in turbidity within the water column near the seafloor would also be anticipated during the process of burying the trunk cable that connects the USWTR to the shore facility. The expected increase in turbidity may occur throughout larger sections of the water column or throughout the entire water column at shallower depths closer to shore. The surface currents and tidal fluctuations in the vicinity of the trunk cable corridor should quickly disperse sediments stirred-up into the water column and return water column turbidity to pre-installation levels shortly after the process of burying the trunk cable is complete. The installation of the trunk cable in the Site B corridor would not adversely affect water column EFH.

- **Impacts on Currents EFH**

  Although surface currents and other circulation features occur at varying spatial and temporal scales throughout the region, the most dominant oceanographic feature in the region is the Gulf Stream. The Gulf Stream is a dynamic feature that undergoes constant fluctuations in its physical properties, including its spatial dimensions. All of the USWTR Site B and approximately 74% of the trunk cable corridor overlap with the Gulf Stream at the proposed USWTR Site B (Table 1-2). Installation of range instrumentation should not impact EFH associated with the Gulf Stream since the scale of the proposed activities is not sufficient to significantly impede or disturb the Gulf Stream or to reduce its suitability as EFH. The installation of the instrumentation and cables in USWTR Site B and along the corridor would not adversely affect currents EFH.

- **Impacts on Nearshore EFH**

  A very small area of nearshore EFH would be impacted by the process of burying the trunk cable that connects the USWTR with the shore facility at each of the four proposed sites. For the purposes of this EFH assessment, nearshore EFH is defined as those waters within 5.6 km (3 NM) of the shoreline (i.e., state waters) and encompasses only the most shoreward section of the trunk cable corridor. This dynamic environment provides important habitat for the majority of fish and invertebrate species with EFH in the region.

To bury the trunk cable, a 10 cm (4 in) wide trench would be excavated to a depth of about 1 m (3 ft) using equipment that is approximately 5 m (16 ft) in width. The area of nearshore EFH within the trunk cable corridor for Site B is approximately 8.4 km^2. The maximum area potentially impacted in the process of burying the trunk cable is estimated as a 5 m (16 ft) wide path extending along the edge of the corridor and represents only 0.48% (0.04 km^2) of the nearshore EFH within the corridor. This is a conservative estimate of the impact area because the cable is likely to traverse a shorter distance closer to the middle of the nearshore corridor, which would reduce the total area impacted by the burial process.

Impacts on soft benthic substrate EFH in the nearshore corridor associated with burying the trunk cable should be minimal and temporary. After the cable is buried, soft sediments and tidal habitat should revert to pre-installation conditions in a relatively short period of time (Street et al. 2005). A study summarizing the recovery of intertidal (as well as other) habitats following disturbance by fishing activity (e.g., dredging and raking) noted that recovery of unconsolidated bottom habitat (without vegetation) occurred in six months to one year (in most cases), but that some habitats, including those with a biogenic component, took as long as two years (Collie et al. 2000). The study demonstrated that repeated disturbance to the same area increased recovery times (Collie et al 2000).

In general, nearshore habitats are dynamic environments subject to constantly changing physical conditions and the flora and fauna that thrive in these environments are often resilient and able to respond and regenerate relatively quickly (~ months to years rather than decades) to disturbances (Collie et al. 2000). Full regeneration of a disturbed habitat will dependent on many factors; however, some of the more consistently critical ones include the size of the disturbance, frequency of subsequent or repeated disturbances, time of year the disturbance occurs, and the presence of other stressors (Allison 1995; Collie et al. 2000; Kaiser et al. 2002).

The turbidity of nearshore waters is likely to increase during the cable burying process, which could impact nearshore EFH by reducing light availability throughout the water column and increasing sedimentation in areas that typically experience low sediment deposition. These impacts would only be temporary as substrate material stirred-up into the water column would be quickly dispersed by nearshore currents and tidal fluctuations. Because of the transient nature of the potential impacts resulting from the burial of the trunk cable, no significant impact on nearshore EFH is anticipated from the installation process. A project similar to this one involving the burial of a fiber optic communications cable in Chesapeake Bay was evaluated for its environmental effects, and it was determined that no significant impacts on the nearshore benthic habitat would result (DoN 2005). Because of the transient nature of the potential impacts, the installation of the trunk cable along the corridor may adversely affect, but would not substantially affect, nearshore EFH.

- **Impacts on HAPC**

HAPC within the proposed USWTR Site B and associated trunk cable corridor consist primarily of live/hard bottom community EFH and pelagic *Sargassum* EFH (Figure 1-8). The first habitat type is benthic HAPC and the second is located in surface waters. The potential impacts on each of these habitats have been assessed previously in this section.

Based on the previous discussion, the installation of the instrumentation and cables both on the USWTR Site B and within the corridor would not adversely affect *Sargassum* HAPC (see section above). Potential impacts on benthic HAPC, however, are described below.

<u>Range</u> – The approximately 300 transducer nodes planned for installation would not be placed on any hard bottom (live or otherwise). The interconnect cables linking the transducers would be buried at the proposed Site B USWTR. Burial of the interconnect cables (totaling 1,110 km [600 NM] in

length) on the seafloor may impact live/hard substrate and communities designated as HAPC (medium to high offshore hard bottom where spawning in species of the snapper-grouper complex occurs, other known spawning locations, and hermatypic coral habitats and reefs) located within the range by displacing or cutting through the hard bottom substrate or communities. Disturbing live/hard bottom HAPC may displace EFH species that use this habitat. The rock ridge system that exists along the shelf break supports benthic EFH species (e.g., snapper-grouper complex) as well as live/hard bottom communities. These areas may be permanently impacted if burying the interconnect cables cuts through sections of the ridge system. As a conservative estimate, the maximum area of substrate (including but not limited to benthic HAPC) potentially impacted by the interconnect cable is 5.55 km^2 (1.62 NM^2) (Figure 1-8). This area represents a small amount (about 2.98%) of the total known live/hard bottom within the proposed range at Site B. Not all live/hard bottom is designated as HAPC EFH (Figure 1-8), so the amount of benthic HAPC potentially impacted would be even less. Despite that fact, due to the potentially long-term nature of any potential disturbance, the installation of the instrumentation and cables in USWTR Site A may adversely affect benthic HAPC.

Corridor – Impacts on benthic HAPC (medium to high offshore hard bottom where spawning in species of the snapper-grouper complex occurs, other known spawning locations, and hermatypic coral habitats and reefs) from the installation process are primarily associated with excavating the furrow for and burying of the trunk cable. Sediment stirred-up into the water column in the process of digging the furrow and burying the trunk cable could settle on benthic HAPC near the cable furrow and inhibit growth. This impact should be temporary, confined to a small area of the corridor, and should not generate siltation greater than that generated by naturally occurring phenomena (e.g., storms). Recovery of any impacted communities is likely given the temporary nature of the disturbance. Cutting through or displacing benthic HAPC may have a longer-lasting impact on these areas. All known live/hard bottom located within the trunk cable corridor encompasses an area of approximately 360 km^2 (105 NM^2) (Table 1-2; Figure 1-5). To bury the trunk cable, a 10 cm (4 in) wide furrow would be excavated to a depth of about 1 m (3 ft) using equipment that is approximately 5 m (16 ft) wide. As a conservative estimate, about 0.46 km^2 (0.13 NM^2) of hard bottom could be disturbed if the trunk cable were laid along a path adjacent to the northern edge of the corridor consisting entirely of hard bottom (an impossible scenario, since areas of non-live/hard bottom occur along this path). Nevertheless, this represents a very small amount (about 0.13%) of known live/hard bottom within the Site B corridor. This is a conservative estimate of the potential impact on benthic HAPC, because the cable is likely to be buried along a shorter path closer to the middle of the corridor which would cover less area, and not all live/hard bottom is designated as HAPC. Given the relative small amount of benthic HAPC in the corridor (Figure 1-8), it should not be difficult to avoid these areas when laying the trunk cable from shore out to the range. Therefore, the installation of the trunk cable in the Site B corridor may adversely affect, but would not substantially affect, benthic HAPC.

2.2.3 Site C—Cherry Point

- **Impacts on Benthic Substrate EFH (not including live/hard bottom substrate)**

Range – The unconsolidated bottom sediments found in the vicinity of the proposed USWTR Site C are described in Chapter 1 and depicted in Figure 1-9. The sediments are mostly quartzite sand, thin layers of fine-grained sand, and silt, and are composed of 25% to 75% calcium carbonate (Hollister 1973; Amato 1994; USGS 2000). Placement of the 300 transducer nodes and the burying of the interconnect cables (1,110 km in length [600 NM]) in the range has the potential to impact benthic substrate EFH within the vicinity of the proposed USWTR Site C. The benthic environment in this area supports a variety of invertebrate species (Street et al. 2005). Although the transducer nodes would not be buried, the interconnect cables spanning the distance between each transducer would be buried. The process of burying the cables would overturn and disturb benthic substrate EFH and benthic species that reside in this area (Wallace 2006). As a conservative estimate, the maximum area of substrate (not including live/hard bottom substrate) potentially impacted by the interconnect cable is 5.55 km^2 (1.62 NM^2) (Figure 1-9). In addition, each individual transducer node would cover approximately 5 m^2 (54 ft^2) of soft substrate, resulting in a total area of impact of about 0.0015 km^2 (0.0004 NM^2) for 300 transducers (Appendix B). The total area of impact (interconnect cables and transducer nodes combined) to benthic substrate EFH (not including live/hard bottom) is estimated to be 5.552 km^2.

The total area of benthic substrate (not including live/hard bottom) in the range is approximately 1,534 km^2 (447 NM^2) of which only 0.36%, would be impacted by the transducers and interconnect cables. This represents a very small area of benthic substrate EFH (not including live/hard bottom) within the proposed USWTR; therefore, the installation of the range instrumentation and cables at the proposed USWTR Site C may adversely affect, but would not substantially affect, benthic substrate EFH (not including live/hard bottom).

Corridor – The unconsolidated sediments in the Site C trunk cable corridor consist of soft sediments such as gravel and sand. Burial of the trunk cable has the potential to impact benthic substrate EFH within the vicinity of the proposed USWTR Site C. The bottom substrate in Onslow Bay, NC consists primarily of two types of sediments: gravelly coarse sand and fine grain sand (USGS 2000). Benthic substrates are formed into numerous shoals that are scattered throughout the corridor and also support a number of benthic species. Digging or plowing a furrow through these shoals to lay the trunk cable may displace benthic species that depend on the varying topography and could possibly alter water flow in the area, temporarily impacting other EFH such as water column and currents.

The two junction boxes used to connect the trunk cables would not be buried and may impact benthic substrate EFH permanently by covering or displacing the sediments. Other impacts on benthic EFH could occur in the area to be trenched to accommodate the proposed burial of the 5.8 cm (2.3 in) diameter cable. Although the furrow would be 10 cm (4 in) wide with a depth of approximately 1 m (3 ft), the burial equipment used to dig the furrow would be 5 m (16 ft) wide and may temporarily displace benthic species and benthic substrate EFH. As a conservative estimate, the maximum area of benthic substrate EFH (not including hard bottom) that could be impacted by the burial equipment and trunk cable is approximately 0.44 km^2 (0.13 NM^2). This represents a minimal amount (0.03%) of benthic substrate (not including hard bottom) within the corridor. The installation of the trunk cable from shore to the proposed USWTR Site C may adversely affect, but would not substantially affect, benthic substrate EFH (not including live/hard bottom).

- **Impacts on Live/Hard Bottom EFH**

Range – The locations of known live/hard bottom substrate found in the vicinity of the proposed USWTR Site C Cherry Point is described in Chapter 1 and depicted in Figure 1-9. Live/hard bottom substrate locations within the range were derived from SEAMAP (2001) data. None of the approximately 300 transducer nodes would be placed on any live/hard bottom substrate; however, burying the interconnect cables (1,110 km [600 NM] in length) in the range would impact live/hard bottom EFH within the proposed USWTR Site C. As the interconnect cables are buried, live/hard bottom EFH would be cut through or crushed by the installation equipment, potentially displacing EFH species that use this area.

Alternatively, lying the interconnect cable directly onto hard bottom substrate would eliminate the initial disruption to live/hard bottom EFH associated with the cable burying process. Although, longer term impacts on live/hard bottom from cable chafing or scouring may occur. An interconnect cable overlaying an area (or areas) of hard bottom will be subject to bottom currents, slumping of the seafloor, or other forces which may induce the cable to shift and may result in chafing or scouring of live/hard bottom (Kogan et al 2003). Cables suspended above the seafloor between two areas of hard bottom substrate have been known to carve grooves over time into the live/hard bottom at the suspension points and may result in fraying or other damage to the cable at those points (Kogan et al. 2003). There is, however, the potential for unburied cables to provide points of attachment for marine fauna, ultimately allowing benthic communities that require hard substrate to expand beyond the extent of naturally occurring hard bottom (ONR 2001; Kogan et al. 2003). On the other hand, significant slumping events have been known to cause communications cables, similar to the interconnect cables, residing on the seafloor to break (Emery and Uchupi 1972). In addition to the interconnect cables, the placement of the transducer nodes on live/hard bottom habitat would adversely impact the organisms colonizing the direct area of the nodes.

Included within the biogenic reef EFH potentially impacted by this action are deepwater coral reefs composed primarily of the hermatypic coral, *Lophelia pertusa*. These *Lophelia* Reefs, as they are known, are located approximately 30 km (16 NM) north and along the seaward boundary of the proposed USWTR Site C (Chapter 1; Figure 1-12). These slow growing coral reefs are EFH for snapper-grouper species, and are on a proposed list as future HAPC sites (SAFMC 2006a). Any damage inflicted on these corals (*Lophelia*) during the installation of range instrumentation could have a long-term and localized significant impact on this habitat because the coral would require decades to centuries to recover (Freiwald et al. 2004; Ross and Nizinski 2007). Although no *Lophelia* Reefs appear to overlap with the proposed USWTR Site C, the southernmost of the two reefs is located just to the southeast of the range, and more precise surveys documenting the exact extent of the *Lophelia* Reefs is needed (Ross and Nizinsk 2007).

As a conservative estimate, the maximum area of live/hard bottom substrate potentially impacted by the interconnect cables and the nodes, assuming that all of the nodes and cables were laid on live/hard bottom, is 5.55 km^2 (1.62 NM^2). This represents about 5.28% of the known live/hard bottom substrate EFH within the proposed USWTR Site C. Although it is unlikely, given the relatively small area disturbed by range installation and the limited availability of live/hard bottom habitat within the range, the installation of the instrumentation and cables at the proposed Site C may adversely affect live/hard bottom EFH present in the range.

<u>Corridor</u> – Burial of the trunk cable could impact live/hard bottom EFH within the vicinity of the proposed USWTR Site C as some live/hard bottom substrate may be cut through or otherwise displaced in order to lay the trunk cable. The junction boxes used to connect the trunk cables would not be buried and may impact biogenic reef community EFH by crushing or covering a small portion of the reef. Permanent impacts would occur to a small number of benthic species (e.g., mollusks) residing in the immediate pathway of the furrow. Although the furrow would only be 10 cm (4 in) wide with a depth of approximately 1 m (3 ft), the burial equipment used to cut through any live/hard bottom and dig the furrow would be 5 m (16 ft) wide and may impact live/hard bottom communities by displacing, burying, or crushing them. Approximately 204 km^2 (59 NM^2) of live/hard bottom EFH exists in the trunk cable corridor for Site C. As a conservative estimate, about 0.44 km^2 (0.13 NM^2) of live/hard bottom EFH could be disturbed if the trunk cable were laid along a path consisting entirely of live/hard bottom substrate. Nevertheless, this represents very small amount (about 0.22%) of known live/hard bottom EFH within the Site C corridor (Appendix B). Because it is highly unlikely that the entire furrow would traverse only live/hard bottom substrate, the amount of live/hard bottom affected will be less than the 0.22% estimated above. Given the relative small amount of live/hard bottom in the corridor, it should not be difficult to avoid these areas when laying the trunk cable from shore out to the range. Therefore, the installation of the trunk cable in the Site C corridor may adversely affect, but would not substantially affect, live/hard bottom EFH.

- **Impacts on Artificial Reef EFH**

<u>Range</u> – Locations of artificial reef EFH found in the vicinity of the proposed USWTR Site C are described in Chapter 1 and depicted in Figure 1-10. No artificial reefs are known to be located within the proposed range at Site C; however, several artificial reefs (or reef complexes) are located to the

north of the proposed range (Figure 1-10). The locations of the artificial reefs were derived from data provided by the NCDMF. If any previously unknown artificial reefs are encountered during the installation of range instrumentation, the installation plan would be altered to avoid any disturbance to artificial reefs. Therefore, the installation of range instrumentation and cables at the proposed USWTR Site C would not adversely affect artificial reef EFH.

Corridor – No artificial reefs are known to be located within the trunk cable corridor (Table 1-2; Figure 1-10). If any previously unknown artificial reefs are encountered during the installation of the trunk cable, the installation plan would be altered to ensure that trenching activities avoid disturbing any artificial reefs. Therefore, the installation of the trunk cable in the Site C corridor would not adversely affect artificial reef EFH.

- **Impacts on Pelagic *Sargassum* EFH**

Pelagic *Sargassum* can occur in all four proposed USWTR sites and provides EFH for several fish species, particularly during the larval lifestage. The exact location of *Sargassum* at any given time within each site is impossible to predict. Since pelagic *Sargassum* is found floating at the sea surface, often at the convergence of surface currents, and is not associated with the benthic environment, no impact on pelagic *Sargassum* EFH is anticipated from the sea-floor installation of range instrumentation. Any disturbance to *Sargassum* by surface equipment (e.g., ships) required to perform the installation would be temporary and would not differ significantly from other maritime traffic occurring in the region. Therefore, the installation of instrumentation and cables in USWTR Site C and the trunk cable in the Site C corridor would not adversely affect pelagic *Sargassum* EFH.

- **Impacts on Water Column EFH**

Range – One hundred percent of the water column is designated as EFH in both the proposed USWTR Site C and adjacent trunk cable corridor (Table 1-2). A localized increase in turbidity within the water column is anticipated near the seafloor during construction of the range. The placement of approximately 300 transducer nodes each covering 5 m^2 (54 ft^2) of soft sediment would likely result in a localized increase in turbidity in the vicinity of the placement sites. The interconnect cable linking the nodes is expected to be buried throughout the range at Site C. The equipment used to excavate the furrow for the cable should generate a significant amount of turbidity from displaced sediments entrained into the water column in the immediate vicinity of the burial equipment; however, deepwater or bottom-layer ocean currents in the vicinity of the range should quickly disperse sediments stirred-up into the water column and return water column turbidity to pre-installation levels shortly after the installation of range instrumentation. Therefore, the installation of range instrumentation and cables at the proposed USWTR Site C would not adversely affect water column EFH.

Corridor – A localized increase in turbidity within the water column near the seafloor would also be anticipated during the process of burying the trunk cable that connects the USWTR to the shore facility. The expected increase in turbidity may occur throughout larger sections of the water column or throughout the entire water column at shallower depths closer to shore. The surface currents and tidal fluctuations in the vicinity of the trunk cable corridor should quickly disperse sediments stirred-up into the water column and return water column turbidity to pre-installation levels shortly after the process of burying the trunk cable is complete. The installation of the trunk cable in the Site C corridor would not adversely affect water column EFH.

- **Impacts on Currents EFH**

Although surface currents and other circulation features occur at varying spatial and temporal scales throughout the region, the most dominant oceanographic feature in the region is the Gulf Stream. The Gulf Stream is a dynamic feature that undergoes constant fluctuations in its physical properties, including its spatial dimensions. In order to map the Gulf Stream, the location of the mean axis of the current was calculated over time, and the standard deviation of the mean axis was used to estimate the width of the current (Figure 1-21). All of the range and approximately 92% of the range and none of the trunk cable corridor overlap with the Gulf Stream at the proposed USWTR Site C (Figure 1-21; Table 1-2). Installation of range instrumentation should not impact EFH associated with the Gulf Stream since the scale of the proposed activities is not sufficient to significantly impede or disturb the Gulf Stream or to reduce its suitability as EFH. Therefore, the installation of the instrumentation and cables in USWTR Site C and along the corridor would not adversely affect currents EFH.

- **Impacts on Nearshore EFH**

A very small area of nearshore EFH would be impacted by the process of burying the trunk cable that connects the USWTR with the shore facility at each of the three proposed sites. For the purposes of this EFH assessment, nearshore EFH is defined as those waters within 3 NM of the shoreline (i.e., state waters) and encompasses only the most shoreward section of the trunk cable corridor. This dynamic environment provides important habitat for the majority of fish and invertebrate species with EFH in the region.

To bury the trunk cable, a 10 cm (4 in) wide trench would be excavated to a depth of about 1 m (3 ft) using equipment that is approximately 5 m (16 ft) in width. The area of nearshore EFH within the trunk cable corridor for Site C is approximately 6.9 km^2 (Table 1-2). The maximum area potentially impacted in the process of burying the trunk cable is estimated as a 5 m wide path extending along the edge of the corridor and represents only 0.43% (0.03 km^2) of the nearshore EFH within the corridor (Appendix B). This is a conservative estimate of the impact area because the cable is likely to traverse a shorter distance closer to the middle of the nearshore corridor, which would reduce the total area impacted by the burial process.

Impacts on soft benthic substrate EFH in the nearshore corridor associated with burying the trunk cable should be minimal and temporary. After the cable is buried, soft sediments and tidal habitat should revert to pre-installation conditions in a relatively short period of time (Street et al. 2005). A study summarizing the recovery of intertidal (as well as other) habitats following disturbance by fishing activity (e.g., dredging and raking) noted that recovery of unconsolidated bottom habitat (without vegetation) occurred in six months to one year (in most cases), but that some habitats, including those with a biogenic component, took as long as two years (Collie et al. 2000). The study demonstrated that repeated disturbance to the same area increased recovery times (Collie et al 2000).

In general, nearshore habitats are dynamic environments subject to constantly changing physical conditions and the flora and fauna that thrive in these environments are often resilient and able to respond and regenerate relatively quickly (~ months to years rather than decades) to disturbances (Collie et al. 2000). Full regeneration of a disturbed habitat will dependent on many factors; however, some of the more consistently critical ones include the size of the disturbance, frequency of subsequent or repeated disturbances, time of year the disturbance occurs, and the presence of other stressors (Allison 1995; Collie et al. 2000; Kaiser et al. 2002).

The turbidity of nearshore waters is likely to increase during the cable burying process, which could impact nearshore EFH by reducing light availability throughout the water column and increasing sedimentation in areas that typically experience low sediment deposition. These impacts would only be temporary as substrate material stirred-up into the water column would be quickly dispersed by nearshore currents and tidal fluctuations. Because of the transient nature of the potential impacts resulting from the burial of the trunk cable, no significant impact on nearshore EFH is anticipated from the installation process. A project similar to this one involving the burial of a fiber optic communications cable in Chesapeake Bay was evaluated for its environmental effects and it was determined that no significant impacts on the nearshore benthic habitat would result (DoN 2005). Because of the transient nature of the potential impacts, the installation of the trunk cable along the corridor may adversely affect, but would not substantially affect, nearshore EFH.

- **Impacts on HAPC**

HAPC within the proposed USWTR Site C and associated trunk cable corridor consist primarily of live/hard bottom community EFH and pelagic *Sargassum* EFH (Figure 1-12). The first habitat type is benthic HAPC and the second is located in surface waters. The potential impacts on each of these habitats have been assessed previously in this section.

Based on the previous discussion, the installation of the instrumentation and cables both on the USWTR Site A and within the corridor would not adversely affect *Sargassum* HAPC (see section above). Potential impacts on benthic HAPC, however, are described below.

Range – The interconnect cables linking the transducers would be buried at the proposed Site C USWTR. Burial of the interconnect cables (totaling 1,110 km [600 NM] in length) on the seafloor may impact live/hard substrate and communities designated as HAPC (medium to high offshore hard bottom where spawning in species of the snapper-grouper complex occurs, other known spawning locations, and hermatypic coral habitats and reefs) located within the range by displacing or cutting through the live/hard bottom substrate or communities. Disturbing benthic HAPC may displace EFH species that use this habitat. The rock ridge system that exists along the shelf break supports benthic EFH species (e.g., snapper-grouper complex) as well as live/hard bottom communities. These areas may be permanently impacted if burying the interconnect cables erodes sections of the ridge system. As a conservative estimate, the maximum area of substrate (including but not limited to benthic HAPC) potentially impacted by the interconnect cable is 5.55 km^2 (1.62 NM^2) (Figure 1-9). This area represents about 5.29% of the total known live/hard bottom within the proposed range at Site C. Not all live/hard bottom is designated as HAPC (Figure 1-12), so the amount of benthic HAPC potentially impacted would be even less. Despite that fact, due to the potentially long-term nature of any potential disturbance, the installation of the instrumentation and cables in USWTR Site C may adversely affect benthic HAPC.

Corridor – Impacts on benthic HAPC (medium to high offshore hard bottom where spawning in species of the snapper-grouper complex occurs, other known spawning locations, and hermatypic coral habitats and reefs) from the installation process are primarily associated with excavating the furrow for and burying of the trunk cable. Sediment stirred-up into the water column in the process of digging the furrow and burying the trunk cable could settle on benthic HAPC near the cable furrow and inhibit growth. This impact should be temporary, confined to a small area of the corridor, and should not generate siltation greater than that generated by naturally occurring phenomena (e.g., storms). Recovery of any impacted communities is likely given the temporary nature of the disturbance. Cutting through or displacing benthic HAPC may have a longer-lasting impact on these areas. All known hard bottom located within the trunk cable corridor encompasses an area of approximately 361 km^2 (105 NM^2) (Figure 1-9; Table 1-2). To bury the trunk cable, a 10 cm (4 in) wide furrow would be excavated to a depth of about 1 m (3 ft) using equipment that is approximately 5 m (16 ft) wide. As a conservative estimate, about 0.44 km^2 (0.13 NM^2) of hard bottom could be disturbed if the trunk cable were laid along a path adjacent to the northern edge of the corridor consisting entirely of hard bottom (an impossible scenario, since areas of non-hard bottom occur along this path). Nevertheless, this represents a very small amount (about 0.12%) of known hard bottom within the Site C corridor. This is a conservative estimate of the potential impact on benthic HAPC, because the cable is likely to be buried along a shorter path closer to the middle of the corridor which would cover less area, and not all hard bottom is designated as HAPC. Given the relative small amount of benthic HAPC in the corridor (Figure 1-12), it should not be difficult to avoid these areas when laying the trunk cable from shore out to the range. Therefore, the installation of the trunk cable in the Site C corridor may adversely affect, but would not substantially affect, benthic HAPC.

2.2.4 Site D—VACAPES

- **Impacts on Benthic Substrate EFH (not including live/hard bottom substrate)**

  Range – Placement of the 300 transducer nodes and burying of the interconnect cables (1,110 km in length [600 NM]) in the range would temporarily impact benthic substrate EFH within the vicinity of the proposed USWTR Site D by covering and disturbing soft sediments.. As a conservative estimate, the maximum area of substrate (not including live/hard bottom substrate) potentially impacted by the interconnect cable is 5.55 km^2 (1.62 NM^2) (Figure 1-13; Table 1-2). Each transducer node would cover approximately 5 m^2 (54 ft^2) of soft substrate totaling an area of about 0.0015 km^2 (0.0004 NM^2). The total area of benthic substrate in the range is approximately 1,591 km^2 (464 NM^2) of which only 0.35%, would be impacted by the transducer nodes and interconnect cables (Table 1-2). This represents a very small area of benthic substrate EFH within the proposed USWTR Site D. The installation of the range instrumentation and cables at the proposed USWTR Site D may adversely affect, but would not substantially affect, benthic substrate EFH (not including live/hard bottom).

  Corridor – Burial of the trunk cable within the Site D corridor has the potential to impact benthic substrate EFH. The two junction boxes used to connect the trunk cables would not be buried but placement of the boxes may impact benthic substrate EFH by displacing or covering these sediments. Permanent impacts would occur to benthic substrate EFH in the area to be trenched to accommodate the burial of the 5.8 cm (2.3 in) diameter trunk cable. As a conservative estimate, the maximum area of benthic substrate EFH (soft sediments) that could be impacted by the burial equipment is approximately 0.32 km^2 (0.09 NM^2). This represents an very small (0.02%) of the benthic substrate EFH within the Site D corridor, such that no significant impacts on benthic substrate EFH are anticipated from the installation of the trunk cable in the proposed USWTR Site D corridor. Due to the relatively small potential area of impact and its temporary nature, the installation of the trunk cable from shore to the proposed USWTR Site D may adversely affect, but would not substantially affect, benthic substrate EFH (not including live/hard bottom).

- **Impacts on Live/Hard Bottom EFH**

  Range –The extent or locations of natural live/hard bottom are unavailable in the sediment data for the VACAPES region (Amato 1994; USGS 2000; NAVO 2006), and the MAFMC could not provide any information on the location of natural live/hard bottom EFH in the region. The MAFMC defines EFH for adult black sea bass as all natural and man-made structured habitats (Hoff 2006). Therefore, for the region surrounding USWTR Site D, shipwrecks serve as live/hard bottom. A single shipwreck is located within the proposed USWTR Site D (Figure 1-13). Since all shipwrecks would be avoided during the installation process, the installation of the range instrumentation and cables at the proposed USWTR Site D would not adversely affect live/hard bottom EFH.

  Corridor – Known locations of live/hard bottom EFH, 22 shipwrecks found within the corridor are described in Chapter 1 and depicted in Figure 1-13. The MAFMC regards shipwrecks as EFH for adult black sea bass (Hoff 2006). All shipwrecks encountered in the corridor would be avoided during the installation process. As a result, the installation of the trunk cable from shore to the proposed USWTR Site D would not adversely affect live/hard bottom EFH.

- **Impacts on Artificial Reef EFH**

  Range – Point data representing artificial reef EFH in the vicinity of the proposed USWTR Site D are described in Chapter 1 and are depicted in Figure 1-14. There are no known artificial reefs located within the proposed USWTR Site D; however, if artificial reefs were to be encountered during the installation process, the installation plan would be altered to avoid impacting any artificial reefs. Therefore, the installation of the range instrumentation and cables at the proposed USWTR Site D would not adversely affect artificial reef EFH.

Corridor – Point data of artificial reefs in the vicinity of the Site D corridor are described in Chapter 1 and depicted in Figure 1-14. There are five artificial reefs located within the Site D corridor (Table 1-2). If artificial reefs were to be encountered during the installation process, the installation plan would be altered to avoid impacting any artificial reefs. As a result, the installation of the trunk cable from shore to the proposed USWTR Site D would not adversely affect artificial reef EFH.

- **Impacts on Pelagic *Sargassum* EFH**

Pelagic *Sargassum* can occur in all four proposed USWTR sites and provides EFH for several fish species, particularly the larval lifestage. The exact location of *Sargassum* at any given time within each site is impossible to predict. Since pelagic *Sargassum* is found floating at the sea surface, often at the convergence of surface currents, and is not associated with the benthic environment, no impact on pelagic *Sargassum* EFH would be anticipated from the installation of range instrumentation on the seafloor. Any disturbance to pelagic *Sargassum* by surface equipment (e.g., ships) required to perform the installation would be temporary and would not differ significantly from other maritime traffic occurring in the region. Therefore, the installation of instrumentation and cables in USWTR Site C and the trunk cable in the Site C corridor would not adversely affect pelagic *Sargassum* EFH.

- **Impacts on Water Column EFH**

Range – One hundred percent of the water column is designated as EFH in both the proposed USWTR Site D and adjacent trunk cable corridor (Table 1-2). A localized increase in turbidity within the water column is anticipated near the seafloor during construction of the range. The placement of approximately 300 transducer nodes each covering 5 m^2 (54 ft^2) of soft sediment would likely result in a localized increase in turbidity in the vicinity of the placement sites. The interconnect cable linking the nodes is expected to be buried throughout the range at Site D. The equipment used to excavate the furrow for the cable should generate a significant amount of turbidity from displaced sediments entrained into the water column in the immediate vicinity of the burial equipment; however, deepwater or bottom-layer ocean currents in the vicinity of the range should quickly disperse sediments stirred-up into the water column and return water column turbidity to pre-installation levels shortly after the installation of range instrumentation is complete. Therefore, the installation of range instrumentation and cables at the proposed USWTR Site D would not adversely affect water column EFH.

Corridor – A localized increase in turbidity within the water column is also anticipated, near the seafloor during the process of burying the trunk cable that connects the USWTR to the shore facility. The expected increase in turbidity may occur throughout larger sections of the water column or possibly throughout the entire the water column at shallower depths closer to shore. The surface currents and tidal fluctuations in the vicinity of the trunk cable corridor should quickly disperse sediments stirred-up into the water column and return water column turbidity to pre-installation levels shortly after the process of burying the trunk cable is complete. The installation of the trunk cable in the Site D corridor would not adversely affect water column EFH.

- **Impacts on Currents EFH**

No currents are designated as EFH in the vicinity of the proposed USWTR Site D or the associated trunk cable corridor; therefore, no adverse effect on currents EFH will occur.

- **Impacts on Nearshore EFH**

A very small area of nearshore EFH would be impacted by the process of burying the trunk cable that connects the USWTR with the shore facility at each of the four proposed sites. For the purposes of this technical report nearshore marine habitat is defined as those waters within 3 NM of the shoreline (i.e., state waters) and encompasses only the most shoreward section of the trunk cable corridor. This dynamic environment provides important habitat for the majority of fish and invertebrate species with EFH in the region.

To bury the trunk cable, a 10 cm (4 in) wide trench would be excavated to a depth of about 1 m (3 ft) using equipment that is approximately 5 m (16 ft) in width. The area of nearshore habitat within the trunk cable corridor for Site D is approximately 50.69 km^2 (14.8 NM^2) (Table 1-2). The maximum area potentially impacted in the process of burying the trunk cable is estimated as a 5 m wide path extending along the edge of the corridor and represents only about 0.16% (0.08 km^2 [0.02 NM^2]) of the nearshore EFH within the corridor (Appendix B). This is a conservative estimate of the impact area since the cable is likely to traverse a shorter distance closer to the middle of the nearshore corridor, which would reduce the area impacted by the burial process.

Impacts on soft benthic substrate EFH in the nearshore corridor associated with burying the trunk cable should be minimal and temporary. After the cable is buried, soft sediments and tidal habitat should revert to pre-installation conditions in a relatively short period of time (Street et al. 2005). A study summarizing the recovery of intertidal (as well as other) habitats following disturbance by fishing activity (e.g., dredging and raking) noted that recovery of unconsolidated bottom habitat (without vegetation) occurred in six months to one year (in most cases), but that some habitats, including those with a biogenic component, took as long as two years (Collie et al. 2000). The study demonstrated that repeated disturbance to the same area increased recovery times (Collie et al 2000).

In general, nearshore habitats are dynamic environments subject to constantly changing physical conditions and the flora and fauna that thrive in these environments are often resilient and able to respond and regenerate relatively quickly (~ months to years rather than decades) to disturbances (Collie et al. 2000). Full regeneration of a disturbed habitat will dependent on many factors; however, some of the more consistently critical ones include the size of the disturbance, frequency of subsequent or repeated disturbances, time of year the disturbance occurs, and the presence of other stressors (Allison 1995; Collie et al. 2000; Kaiser et al. 2002).

No natural hard bottom (e.g., hard bottom substrate) has been located in the nearshore corridor at Site D (Amato 1994; USGS 2000; NAVO 2006). The MAFMC has designated shipwrecks as hard bottom EFH (Hoff 2006), and although there are 22 shipwrecks located in the Site D trunk cable corridor, none are found in the nearshore portion of the corridor (Figure 1-13). The total amount of benthic substrate impacted by burying the trunk cable would only represent 0.16% of the total benthic habitat in the nearshore corridor. While benthic EFH may be adversely affected, this area is so small that the potential impact on nearshore benthic EFH resulting from the burial of the trunk cable would not be substantial.

The turbidity of nearshore waters is likely to increase during the cable burying process, which could impact nearshore EFH by reducing light availability throughout the water column and increasing sedimentation in areas that typically experience low sediment deposition. These impacts would only be temporary as substrate stirred-up into the water column would be dispersed by nearshore currents and tidal fluctuations. Due to the transient nature of the potential impacts resulting from the burial of the trunk cable, no significant permanent impacts on nearshore EFH would be anticipated. A project similar to this one involving the burial of a fiber optic communications cable in Chesapeake Bay was evaluated for its environmental effects, and it was determined that no significant impacts on the nearshore benthic habitat would result (DoN 2005). Because of the transient nature of the potential impacts, the installation of the trunk cable along the corridor may adversely affect, but would not substantially affect,nearshore EFH.

- **Impacts on HAPC**

No HAPC are designated in the vicinity of the proposed USWTR Site D or the associated trunk cable corridor; therefore, no adverse effects on HAPCs would occur.

2.3 Range Operation—Exercise Torpedoes

2.3.1 Site A—Jacksonville

- **Impacts on Benthic Substrate EFH (not including live/hard bottom)**

All torpedoes deployed within the range are planned to be recovered. Forty-eight MK 48 exercise torpedoes (EXTORPs) would be released each year at the USWTR and each contains 24 kilograms (kg) (53 pounds [lb]) of metallic lead ballast totaling 1,158 kg (2,554 lb) in addition to 76.2 m (250 ft) of thin-gauge copper control wire encased in flex hose. The flex hose would sink along with the copper wire, and could have temporary impacts on the benthic substrate EFH as a result of this action.

The MK 46 and MK 54 lightweight torpedoes all have expendable materials when they are air launched. The expendable materials from these torpedoes could have temporary impacts on benthic soft EFH substrates. Forty-eight percent of the approximately 328 lightweight torpedoes used on the USWTR would be MK 46s, and an estimated 10%, or 16 of these would be EXTORPs. Upon completion of an MK 46 EXTORP run, two steel jacketed lead ballast weights would be released to lighten the torpedo, allowing it to rise to the surface for recovery. Therefore, approximately 32 16.8-kg (37-lb) ballasts would be expended annually, totaling 537 kg (1,184 lb) of lead ballast. In addition, 51 MK 46 recoverable exercise torpedoes (REXTORPs) would be deployed and each uses six ballasts (totaling 82 kg (180 lb) of lead), resulting in the expenditure of 4,164 kg (9,180 lb) of lead ballast. The total amount of lead ballasts used between the MK 48, MK 46 REXTORP and MK 46 EXTORPs would be 5,322 kg (12,918 lb) which could have temporary and minimal impacts on the benthic substrate EFH in the immediate vicinity. There are no lead weights associated with the MK 54 EXTORP or REXTORP.

In addition five vertical launch antisubmarine (VLA) rockets would be mounted to MK 46 EXTORPs and while the torpedoes would be recovered the rockets would not. The closer to the shelf break within the range, the finer the sediment, and the greater the opportunity for sediments and benthic EFH species to be disturbed from discarded torpedoes and associated material (e.g., 16.8 kg [37 lb]) ballasts, rocket airframes, etc. from heavyweight EXTORPs). Overall, continued use of the range throughout the year could aggravate the benthic substrate EFH through the accumulation of discarded materials from the torpedo exercises; however, once these materials (e.g. lead ballast and flex hoses) are covered by sediments, at which time anoxic conditions are likely to prevail, no subsequent impacts (e.g., the ionizing of lead into the benthic environment) are likely to occur. It is reasonable to expect, therefore, that once discarded materials resulting from torpedo exercise are covered by soft sediments, that the materials would have a minimal impact on the benthic substrate EFH. Given these probable circumstances, exercise torpedoes will not adversely affect benthic substrate (not including live/hard bottom) EFH.

- **Impacts on Live/Hard Bottom EFH**

Forty-eight MK 48 EXTORPs would be released each year at the USWTR and each contains 24 kg (53 lb) of metallic lead ballast totaling 1,158 kg (2,554 lb) in addition to 76.2 m (250 ft) of thin-gauge copper control wire encased in flex hose. The flex hose would sink along with the copper wire, and may temporary affect but not cause significant harm to live/hard bottom EFH.

Forty-eight percent of the approximately 328 lightweight torpedoes used on the USWTR would be MK 46s, and an estimated 10%, or 16 of these would be EXTORPs. Upon completion of an MK 46 EXTORP run, two steel jacketed lead ballast weights would be released to lighten the torpedo, allowing it to rise to the surface for recovery. Therefore, approximately 32 16.8-kg (37-lb) ballasts would be expended annually, totaling 537 kg (1,184 lb) of lead ballast. In addition 51 MK 46 REXTORPs would be deployed and each uses six ballasts (totaling 82 kg (180 lb) of lead), resulting in the expenditure of 4,164 kg (9,180 lb) of lead ballast. The total amount of lead ballasts used between the MK 48, MK 46 REXTORP and MK 46 EXTORPs would be 5,322 kg (12,918 lb), which could have long-term, adverse impacts on live/hard bottom EFH in the immediate vicinity by contamination and destruction. Therefore, torpedo exercises in the vicinity of USWTR Site A may adversely affect live/hard bottom EFH.

- **Impacts on Artificial Reef EFH**

There is no known artificial reef EFH in the vicinity of the proposed USWTR Site A; therefore, there would not be adverse effects on artificaial reef EFH.

- **Impacts on Pelagic *Sargassum* EFH**

Pelagic *Sargassum* can occur in all four proposed USWTR sites and provides EFH for several fish species, particularly the larval lifestage. The exact location of *Sargassum* at any given time within each site is impossible to predict. Exercise torpedoes released into water from either a ship or an aircraft may briefly encounter pelagic *Sargassum* floating at the surface and temporarily disturb *Sargassum* mats. Recovery of exercise torpedoes occurs at the surface and also has the potential to interact with pelagic *Sargassum* EFH. Given the patchy distribution of *Sargassum* and the transient nature of potential interaction, any disturbance would be expected to be temporary and would not adversely affect pelagic *Sargassum* EFH.

- **Impacts on Water Column EFH**

Torpedo exercises conducted in the USWTR would result in the release of chemicals.. One hundred percent of the water column is designated as EFH in the Site A USWTR (Table 1-2). All chemical releases, even those associated with a worst-case scenario, would either be temporary and quickly dilute within the water column, or would occur at a slow rate over a long period of time such that high concentrations should not accumulate in the water column. Therefore, no long-term impacts on water column EFH would be anticipated. The following three occurrences of chemical releases have the potential to impact water column EFH and are addressed to assess the magnitude of their impact:

1. Chemicals released as exhaust from EXTORPs equipped with a propulsion system may pose a temporary risk to water column EFH. Most exhaust chemicals occur naturally in seawater; however, one chemical, hydrogen cyanide (HCN), does not, and, if in high enough concentrations, could pose a risk to both humans and marine biota. The United States Environmental Protection Agency (USEPA) national recommendation for cyanide in marine waters is 1 microgram per liter (µg/L), or approximately 1 part per billion (ppb), for both acute and chronic criteria (USEPA 2006). MK 46 and MK 54 torpedoes are expected to discharge HCN concentrations of 280 ppb, and MK 48 torpedoes are expected to discharge HCN concentrations ranging from 140 to 150 ppb (Ballentine 1995 and Qadir et al. 1994, as cited in DoN, 1996a, 1996b). These initial concentrations are well above the USEPA recommendations for cyanide; however, because it has extremely high solubility in seawater, HCN would diffuse to levels below 1 µg/L within 5.4 m (17.7 ft) of the center of the torpedo's path, and thus should not adversely affect marine organisms or water column EFH (DoN 2008).
2. MK 46, MK 54, and MK 48 torpedoes contain potentially hazardous or harmful (non-propulsion-related) components and materials (DoN 2008). Only very small quantities of these materials, however, are contained in each torpedo. During normal exercise operations, the torpedo is sealed and is recovered at the end of a run; therefore, none of the potentially hazardous or harmful materials would be released to the marine environment. The MK 48 torpedo uses either a strong flex hose (SFH) or improved flex hose (IFH). The IFH is a multi-component design that consists of a stainless-steel spring overlaid with a polyester braid and then a layer of lead tape (DoN 1996b). The entire assembly is then overlaid with a stainless-steel wire braid (DoN 1996b). The SFH is constructed primarily of stainless steel and contains no lead or other materials that may pose a threat to the marine environment (DoN 1996b).

The Navy estimated the release of lead to the marine environment from the corrosion of the IFH based on a worst-case scenario, assuming low pH and high oxidation potential (Eh) levels, no sedimentation, no marine growth or oxide buildup on the IFH, and no current or water movement (DoN 1996b). The USEPA national recommended water quality criteria for lead in marine waters are 210 µg/L, or approximately 210 ppb for acute exposure and 8.1 µg/L for chronic exposure (USEPA 2006). Adverse effects from lead exposure are most pronounced at elevated water temperatures and reduced pH, in comparatively soft waters, in younger life stages, and after long exposures (Eisler 1988). Based on this worst-case scenario, the Navy determined that the maximum distance from the IFH in which the average concentration of lead in seawater may be toxic to marine life would be 15.6 cm (6.1 in) (DoN 1996b). Organisms that are within this distance of the IFH may be exposed to short-term lead levels that are above the USEPA acute toxicity water quality criteria for seawater aquatic life, which is 0.210 parts per million (ppm).

On the ocean bottom in the USWTR, however, the reaction of the IFH with the marine environment would be retarded because the usual bottom conditions are slightly basic, with a lower pH and lower temperature. Over time, the cable would be increasingly less exposed to the full marine environment because of sedimentation, marine growth, and oxide coatings. It is reasonable to expect, therefore, that the actual average amount of lead released into seawater would be substantially less than this study predicts, and the lead that is released would be dispersed at a much higher rate than predicted.

The increased lead concentration over the entire extent of the USWTR appears insignificant. Because the low amounts of lead released to the marine environment are below concentrations that could adversely affect marine life, the lead contained in the IFH would pose no environmental threat to marine mammals, threatened/endangered species, or the marine environment, inclusive of fish and invertebrates. In addition, the release of IFHs at USWTR Site A should not cause significant harm to water column EFH.

Further, upon completion of a MK 46 EXTORP run, two steel-jacketed lead ballast weights are released to lighten the torpedo, allowing it to rise to the surface for recovery. Each ballast weighs 16.8 kg (37 lb) and sinks rapidly to the bottom. Approximately 32 16.8-kg (37-lb) ballasts would be expended annually, totaling 537 kg (1,184 lb) of lead ballast. In addition to the ballasted MK 46 EXTORPs, MK 46 REXTORPs launched from P-3s also must be ballasted for safety purposes. Ballast weights for these REXTORPs are similarly released to allow for torpedo recovery. Ballasting the MK 46 REXTORP for P-3 use requires six ballasts, totaling 82 kg (180 lb) of lead. It is estimated that a maximum of 51 MK 46 REXTORPs would be launched by P-3s, resulting in the expenditure of 4,164 kg (9,180 lb) of lead ballast. In areas of soft bottom, ballasts would be buried quickly in the sediments.

The USEPA saltwater quality standard for lead is 8.1 µg/L continuous and 210 µg/L maximum (USEPA 2006). Lead is a minor constituent of seawater, with a background concentration of 0.02 to 0.4 µg/L (Kennish, 1989).

The metallic lead of the ballast weights is unlikely to mobilize into the sediment or water as lead ions for three reasons. First, the lead is jacketed with steel, which means that the surface of the lead would not be exposed directly to the actions of seawater. Second, even if the lead were exposed, the general bottom conditions are slightly basic with low oxygen content (i.e., a reducing environment) and would prohibit the lead from ionizing. In addition, only a small percentage of lead is soluble in seawater. Finally, in soft-bottom areas, the lead weights would be buried due to the velocity of their impact with the bottom. Sediments are generally anoxic and thus no lead would be ionized (DoN, 1996a). Studies at other ranges have shown the impact of lead ballasts to be minimal, as they are buried deep in sediments where they are not biologically available (Environmental Sciences Group 2005). There would be no cumulative effects from the lead ballasts due to the low probability of mobilization. Therefore, the lead ballasts released at USWTR Site A will not adversely affect water column EFH.

3. Under the worst-case scenario of a catastrophic failure of an EXTORP, up to 27 kg (59 lb) of OTTO Fuel II could be released from a MK 46 or MK 54 torpedo, or up to 152 to 203 kg (335 to 448 lb) from a MK 48 torpedo (DoN 2008). While OTTO Fuel II levels generally should not exceed 0.5 milligrams per liter (mg/L) to prevent toxicity to marine organisms (DiSalvo et al. 1976), it is anticipated that even in the event of such a maximum potential spill, no long-term adverse impacts to the marine environment would result, because:
   - The water volume, depth, and ocean currents of the USWTR would dilute the spill.
   - Five types of common marine bacteria (*Pseudomonas, Flavobacterium, Vibrio, Achromobacter,* and *Arthrobacter*) that exist at all proposed USWTR sites attack and ultimately break down OTTO fuel (DoN 2008).

   Therefore, the use of EXTORPs at USWTR Site A will not adversely affect water column EFH.

- **Impacts on Currents EFH**

  Although surface currents and other circulation features occur at varying spatial and temporal scales throughout the region, the most dominant oceanographic feature in the region is the Gulf Stream. The Gulf Stream is a dynamic feature that undergoes constant fluctuations in its physical properties, including its spatial dimensions. All of the range at Site A overlaps with the Gulf Stream (Figure 1-3; Table 1-2).

  Torpedo exercises conducted at the USWTR should not impact EFH associated with the Gulf Stream since none of the proposed operations should reduce the suitability of the Gulf Stream to function as EFH. Torpedoes and expendable equipment would only reside within current for a brief period of time after which they would either be recovered or sink to the seafloor. Torpedo exercises conducted at the proposed USWTR Site A will not adversely affect currents EFH.

- **Impacts on Nearshore EFH**

  No adverse effects on nearshore EFH would be anticipated from torpedo exercises conducted at the proposed USWTR Site A since the range would be located over 93 km (50 NM) from shore and would not overlap with any nearshore EFH.

- **Impacts on HAPC**

  HAPC within the proposed USWTR Site A consist primarily of pelagic *Sargassum* (Figure 1-4) and live/hard bottom communities. The first habitat type is limited to surface waters and the second is benthic HAPC. The potential impacts on each of these habitats have been assessed previously in this section.

  No adverse impacts on pelagic *Sargassum* HAPC would be anticipated from torpedo exercises conducted at the proposed USWTR Site A (see section above). Potential impacts on benthic HAPC are primarily associated with the materials and equipment expended during the torpedo exercises. Two types of torpedoes would be used at the USWTR, the heavyweight MK 48 EXTORP and the lightweight MK 46 and MK 54 torpedoes. Expended materials and equipment include control wire, flex hose (IFH or SFH), air launch accessories, and lead ballast. The 328 torpedoes potentially used at the USWTR annually would be recovered immediately following each exercise and should not pose a significant impact on HAPC. An estimated 48 control wires and flex hoses would be released into the USWTR each year, and could potentially cover HAPC after sinking to the seafloor. It is anticipated that up to 5,322 kg (12,918 lb) of lead ballast from MK 48, MK 46 EXTORP and REXTORP torpedoes would be expended per year in the USWTR. These steel-encased lead ballasts would sink rapidly to the seafloor and could damage HAPC upon impact with hard bottom substrate.

Furthermore, if the steel casing becomes cracked or otherwise damaged the rate of corrosion and subsequent release of lead into the immediate benthic environment could result in some level of lead contamination to benthic HAPC, particularly if the lead ballast is permitted to accumulate in the immediate vicinity of benthic HAPC over a period of years.

No information is available on the bottom area extent of the 146 HAPC located within the proposed USWTR Site A (Table 1-2). The area of the range at Site A is 1,535 km^2 (448 NM^2) and the HAPC are grouped shoreward and in a line approximately parallel to the shelf break, which crosses the eastern-most third of the range in the north-south direction (Figure 1-4). The probability of expendable materials settling on HAPC would be expected to be relatively low given that the HAPC are consolidated into a narrow band within the range; however, if torpedo operations are conducted such that the expended materials (particularly lead ballast) are released disproportionately over areas of the range with high concentrations within HAPC, then adverse impacts may occur over time.

Regarding potential lead contamination of benthic HAPC, organisms that are within the immediate vicinity (~ 15.6 cm [2.14 in]) of lead in the flex hose assembly may be exposed to short-term lead levels that are above the USEPA acute toxicity water quality criteria for seawater aquatic life, which is 0.140 ppm (DoN 1996b). On the ocean bottom in the USWTR, however, the reaction of the lead ballast and the IFH with the marine environment would be retarded because the usual bottom conditions are slightly basic, with a lower Eh (reduction potential) and lower temperature. Also, over time the ballast and flex hose would be increasingly less exposed to the full marine environment because of sedimentation, marine growth, and oxide coatings. Once lead ballast and flex hose are covered by sediments, anoxic conditions are likely to prevail and subsequent ionizing of lead into the benthic environment would all but cease. It is reasonable to expect, therefore, that the actual amount of lead released into the benthic environment would be substantially less than predicted in the IFH analysis. Overall, however, torpedo exercises over time may adversely affect benthic HAPC within the USWTR Site A.

2.3.2 Site B—Charleston

- **Impacts on Benthic Substrate EFH (not including live/hard bottom)**

Expended material released from torpedo exercises could potentially impact benthic substrate EFH. All torpedoes deployed within the range would be recovered. Forty-eight MK 48 EXTORPs would be released each year at the USWTR. Each MK 48 contains 24 kg (53 lb) of metallic lead ballast, totaling 1,158 kg (2,554 lb), and 76.2 m (250 ft) of thin-gauge copper control wire encased in flex hose. The flex hose would sink along with the copper wire and could have temporary impacts on the benthic substrate EFH as a result of this action.

The MK 46 and MK 54 lightweight torpedoes all release expendable materials when they are air launched. The expendable materials from these torpedoes could potentially have temporary impacts on benthic soft substrates EFH. Forty-eight percent of the approximately 328 lightweight torpedoes used on the USWTR would be MK 46s, and an estimated 10%, or 16 of these would be EXTORPs. Upon completion of an MK 46 EXTORP exercise, two steel-jacketed lead ballast weights would be released to lighten the torpedo, allowing it to rise to the surface for recovery. Therefore, approximately 32 16.8 kg (37 lb) ballasts would be expended annually, totaling 537 kg (1,184 lb) of lead ballast. In addition, 51 MK 46 REXTORPs would be deployed and each uses six ballasts (totaling 82 kg (180 lb) of lead), resulting in the expenditure of 4,164 kg (9,180 lb) of lead ballast. The total amount of lead ballasts used between the MK 48, MK 46 REXTORP and MK 46 EXTORPs would be 5,322 kg (12,918 lb), which could have temporary and minimal impacts the benthic substrate EFH in the immediate vicinity. There are no lead weights associated with the MK 54 EXTORP or REXTORP.

In addition, five VLA rockets would be mounted to MK 46 EXTORPs and while the torpedoes would be recovered the rockets would not. The closer to the shelf break, the finer the sediments, and the greater the opportunity for these sediments to be disturbed from discarded torpedo material (i.e., 16.8 kg [37 lb] ballasts, rocket airframes, etc. from heavyweight EXTORPs), which increases the ability for disturbed sediments to smother benthic EFH species. Overall, the continued use of the range throughout the year could aggravate the benthic substrate EFH due to discarded material from the exercise torpedoes or the malfunction and scuttling of the torpedoes onto the ocean seabed; however, once lead ballast and flex hose are covered by sediments, anoxic conditions are likely to prevail and subsequent ionizing of lead into the benthic environment would all but cease. It is reasonable to expect, therefore, that the actual amount of lead released into the benthic environment would be substantially less than predicted in the IFH analysis. Given these probable circumstances, exercise torpedoes will not adversely affect benthic substrate (not including live/hard bottom) EFH.

- **Impacts on Live/Hard Bottom EFH**

  Forty-eight MK 48 EXTORPs would be released each year at the USWTR range and each contains 24 kg (53 lb) of metallic lead totaling 1,158 kg (2,554 lb). In addition, 76.2 m (250 ft) of thin-gauge copper control wire encased in flex hose would be released and subsequently sink, which may temporarily affect, but not cause significant harm to, live/hard bottom EFH.

  Forty-eight percent of the approximately 328 lightweight torpedoes used on the USWTR would be MK 46s, and an estimated 10%, or 16 of these would be EXTORPs. Upon completion of an MK 46 EXTORP run, two steel jacketed lead ballast weights would be released to lighten the torpedo, allowing it to rise to the surface for recovery. Therefore, approximately 32 16.8 kg (37 lb) ballasts would be expended annually, totaling 537 kg (1,184 lb) of lead ballast. In addition 51 MK 46 REXTORPs would be deployed and each uses six ballasts (totaling 82 kg (180 lb) of lead), resulting in the expenditure of 4,164 kg (9,180 lb) of lead ballast. The total amount of lead ballasts used between the MK 48, MK 46 REXTORP and MK 46 EXTORPs would be 5,322 kg (12,918 lb), which could have long-term, adverseimpacts on live/hard bottom EFH in the immediate vicinity by contamination and destruction. The Lophelia Reefs (Savannah Lithoherms) located along the seaward boundary of the range along the shelf break are important for snapper-grouper species and are slow growing. Any damage inflicted on these corals (*Lophelia*) from discarded lead ballasts or malfunctioning torpedoes resulting from the proposed action could take decades to centuries for the coral to recover. Therefore, torpedo exercises in the vicinity of USWTR Site B may adversely affect live/hard bottom EFH.

- **Impacts on Artificial Reef EFH**

  There are no known artificial reefs located in the range at Site B (Figure 1-5). While the Charleston Deep Artificial Reef MPA was recently designated and is located within Site B, no reef material has been placed at the site at this time. If site B is selected for the USWTR and artificial reef material is to be placed at the MPA, additional analysis of potential impacts on the reef and the range will be conducted.

- **Impacts on Pelagic *Sargassum* EFH**

  Pelagic *Sargassum* can occur in all four proposed USWTR sites and provides EFH for several fish species, particularly the larval lifestage. The exact location of *Sargassum* at any given time within each site is impossible to predict. Exercise torpedoes released into water from either a ship or an aircraft may briefly encounter pelagic *Sargassum* floating at the surface and temporarily disturb *Sargassum* mats. Recovery of exercise torpedoes occurs at the surface and also has the potential to interact with pelagic *Sargassum* EFH. Given the patchy distribution of *Sargassum* and the transient nature of potential interaction, any disturbance would be expected to be temporary and would not adversely affect pelagic *Sargassum* EFH.

- **Impacts on Water Column EFH**

Torpedo exercises conducted in the USWTR would result in the release of chemicals. One hundred percent of the water column is designated as EFH in the Site B USWTR (Table 1-2; Figure 1-12). All chemical releases, even those associated with a worst-case scenario, would either be temporary and quickly dilute within the water column, or would occur at a slow rate over a long period of time such that high concentrations should not accumulate in the water column. Therefore, no long-term impacts on water column EFH would be anticipated. The following three occurrences of chemical releases have the potential to impact water column EFH and are addressed to assess the magnitude of their impact:

1. Chemicals released as exhaust from EXTORPs equipped with a propulsion system may pose a temporary risk to water column EFH. Most exhaust chemicals occur naturally in seawater; however, one chemical, HCN, does not, and, if in high enough concentrations, could pose a risk to both humans and marine biota. The USEPA national recommendation for cyanide in marine waters is 1 µg/L, or approximately 1 ppb, for both acute and chronic criteria (USEPA, 2006). MK 46 and MK 54 torpedoes are expected to discharge HCN concentrations of 280 ppb, and MK 48 torpedoes are expected to discharge HCN concentrations ranging from 140 to 150 ppb (Ballentine 1995 and Qadir et al. 1994, as cited in DoN 1996a, 1996b). These initial concentrations are well above the USEPA recommendations for cyanide; however, because it has extremely high solubility in seawater, HCN would diffuse to levels below 1 µg/L within 5.4 m (17.7 ft) of the center of the torpedo's path, and thus should not adversely affect marine organisms or water column EFH (DoN 2008).

2. MK 46, MK 54, and MK 48 torpedoes contain potentially hazardous or harmful (non-propulsion-related) components and materials (DoN 2008). Only very small quantities of these materials, however, are contained in each torpedo. During normal exercise operations, the torpedo is sealed and is recovered at the end of a run; therefore, none of the potentially hazardous or harmful materials would be released to the marine environment. The MK 48 torpedo uses either an SFH or IFH. The IFH is a multi-component design that consists of a stainless-steel spring overlaid with a polyester braid and then a layer of lead tape (DoN 1996b). The entire assembly is then overlaid with a stainless-steel wire braid (DoN 1996b). The SFH is constructed primarily of stainless steel and contains no lead or other materials that may pose a threat to the marine environment (DoN 1996b).

   The Navy estimated the release of lead to the marine environment from the corrosion of the IFH based on a worst-case scenario, assuming low pH and high Eh levels, no sedimentation, no marine growth or oxide buildup on the IFH, and no current or water movement (DoN 1996b). The USEPA national recommended water quality criteria for lead in marine waters are 210 µg/L, or approximately 210 ppb for acute exposure and 8.1 µg/L for chronic exposure (USEPA 2006). Adverse effects from lead exposure are most pronounced at elevated water temperatures and reduced pH, in comparatively soft waters, in younger life stages, and after long exposures (Eisler 1988). Based on this worst-case scenario, the Navy determined that the maximum distance from the IFH in which the average concentration of lead in seawater may be toxic to marine life would be 15.6 cm (6.1 in) (DoN 1996b). Organisms that are within this distance of the IFH may be exposed to short-term lead levels that are above the USEPA acute toxicity water quality criteria for seawater aquatic life, which is 0.210 ppm.

   On the ocean bottom in the USWTR, however, the reaction of the IFH with the marine environment would be retarded because the usual bottom conditions are slightly basic, with a lower pH and lower temperature. Over time the cable would be increasingly less exposed to the full marine environment because of sedimentation, marine growth, and oxide coatings. It is reasonable to expect, therefore, that the actual average amount of lead released into seawater would be substantially less than this study predicts, and the lead that is released would be dispersed at a much higher rate than predicted.

The increased lead concentration over the entire extent of the USWTR appears insignificant. Because the low amounts of lead released to the marine environment are below concentrations that could adversely affect marine life, the lead contained in the IFH would pose no environmental threat to marine mammals, threatened/endangered species, or the marine environment, inclusive of fish and invertebrates. In addition, the release of IFHs at USWTR Site B should not cause significant harm to water column EFH.

Further, upon completion of a MK 46 EXTORP run, two steel-jacketed lead ballast weights are released to lighten the torpedo, allowing it to rise to the surface for recovery. Each ballast weighs 16.8 kg (37 lb) and sinks rapidly to the bottom. Approximately 32 16.8-kg (37-lb) ballasts would be expended annually, totaling 537 kg (1,184 lb) of lead ballast. In addition to the ballasted MK 46 EXTORPs, MK 46 REXTORPs launched from P-3s also must be ballasted for safety purposes. Ballast weights for these REXTORPs are similarly released to allow for torpedo recovery. Ballasting the MK 46 REXTORP for P-3 use requires six ballasts, totaling 82 kg (180 lb) of lead. It is estimated that a maximum of 51 MK 46 EXTORPs would be launched by P-3s, resulting in the expenditure of 4,164 kg (9,180 lb) of lead ballast. In areas of soft bottom, ballasts would be buried quickly in the sediments.

The USEPA saltwater quality standard for lead is 8.1 µg/L continuous and 210 µg/L maximum (USEPA 2006). Lead is a minor constituent of seawater, with a background concentration of 0.02 to 0.4 µg/L (Kennish 1989).

The metallic lead of the ballast weights is unlikely to mobilize into the sediment or water as lead ions for three reasons. First, the lead is jacketed with steel, which means that the surface of the lead would not be exposed directly to the actions of seawater. Second, even if the lead were exposed, the general bottom conditions are slightly basic with low oxygen content (i.e., a reducing environment) and would prohibit the lead from ionizing. In addition, only a small percentage of lead is soluble in seawater. Finally, in soft-bottom areas, the lead weights would be buried due to the velocity of their impact with the bottom. Sediments are generally anoxic and thus no lead would be ionized (DoN 1996a). Studies at other ranges have shown the impact of lead ballasts to be minimal, as they are buried deep in sediments where they are not biologically available (Environmental Sciences Group 2005). There would be no cumulative effects from the lead ballasts due to the low probability of mobilization. Therefore, the lead ballasts released at USWTR Site B will not adversely affect water column EFH.

3. Under the worst-case scenario of a catastrophic failure of an EXTORP, up to 27 kg (59 lb) of OTTO Fuel II could be released from a MK 46 or MK 54 torpedo, or up to 152 to 203 kg (335 to 448 lb) from a MK 48 torpedo (DoN 2008). While OTTO Fuel II levels generally should not exceed 0.5 mg/L to prevent toxicity to marine organisms (DiSalvo et al. 1976), it is anticipated that even in the event of such a maximum potential spill, no long-term adverse impacts to the marine environment would result, because:

    - The water volume, depth, and ocean currents of the USWTR would dilute the spill.
    - Five types of common marine bacteria (*Pseudomonas, Flavobacterium, Vibrio, Achromobacter,* and *Arthrobacter*) that exist at all proposed USWTR sites attack and ultimately break down OTTO fuel (DoN 2008).

    Therefore, the use of EXTORPs at USWTR Site B will not adversely affect water column EFH.

- **Impacts on Currents EFH**

  Although surface currents and other circulation features occur at varying spatial and temporal scales throughout the region, the most dominant oceanographic feature in the region is the Gulf Stream. The Gulf Stream is a dynamic feature that undergoes constant fluctuations in its physical properties, including its spatial dimensions. All of the range overlaps with the Gulf Stream (Figure 1-7; Table 1-2).

  Torpedo exercises conducted at the USWTR should not impact EFH associated with the Gulf Stream since none of the proposed operations should reduce the suitability of the Gulf Stream to function as EFH. Torpedoes and expendable equipment would only reside within current for a brief period of time after which they would either be recovered or sink to the seafloor. Torpedo exercises conducted at the proposed USWTR Site B will not adversely affect currents EFH.

- **Impacts on Nearshore EFH**

  No adverse effects on nearshore EFH is anticipated from torpedo exercises conducted at the proposed USWTR Site B, because the range would be located over 92 km (50 NM) from shore and would not overlap with any nearshore EFH.

- **Impacts on HAPC**

  HAPC within the proposed USWTR Site B consist primarily of pelagic *Sargassum* (Figure 1-8) and live/hard bottom communities. The first habitat type is limited to surface waters and the second is benthic HAPC. The potential impacts on each of these habitats have been assessed previously in this section.

  No adverse effect on pelagic *Sargassum* HAPC is anticipated from torpedo exercises conducted at the proposed USWTR Site B (see section above). Potential impacts on benthic HAPC are primarily associated with the materials and equipment expended during the torpedo exercises. Two types of torpedoes would be used at the USWTR, the heavyweight MK 48 EXTORP and the lightweight MK 46 and MK 54 torpedoes. Expended materials and equipment include control wire, flex hose (IFH or SFH), air launch accessories, and lead ballast. All of the 328 torpedoes estimate for use at the USWTR annually are planned for recovery immediately following each exercise and should not pose a significant impact on HAPC. An estimated 48 control wires and flex hoses would be released into the USWTR each year, and could potentially cover HAPC after sinking to the seafloor. It is anticipated that up to 5,322 kg (12,918 lb) of lead ballast from MK 48, MK 46 EXTORP and REXTORP torpedoes would be expended per year in the USWTR. These steel-encased lead ballasts would sink rapidly to the seafloor and could damage HAPC upon impact with hard substrate. Furthermore, if the steel casing becomes cracked or otherwise damaged, the rate of corrosion and subsequent release of lead into the immediate benthic environment could result in some level of lead contamination to benthic HAPC, particularly if the lead ballast is permitted to accumulate in the immediate vicinity of benthic HAPC over a period of years.

  No information is available on the areal extent of HAPC bottom area in the range. The area of the range at Site B is 1,471 km^2 (429 NM^2) and 79 HAPC are located at the proposed USWTR Site B (Figure 1-8; Table 1-2). The probability of expendable materials settling on HAPC would be low.

  Regarding potential lead contamination of benthic HAPC, organisms that are within the immediate vicinity (~ 15.6 cm [~ 6.14 in]) based on an analysis of lead in the flex hose assembly may be exposed to short-term lead levels that are above the USEPA acute toxicity water quality criteria for seawater aquatic life, which is 0.140 ppm (DoN 1996b). On the ocean bottom in the USWTR, however, the reaction of the lead ballast and the IFH with the marine environment would be retarded because the usual bottom conditions are slightly basic, with a lower Eh and lower temperature. Also, over time the ballast and flex hose would be increasingly less exposed to the full marine environment because of sedimentation, marine growth, and oxide coatings. Once sediments cover lead ballast and flex hose, anoxic conditions are likely to prevail and subsequent ionizing of lead into the benthic environment would all but cease. It is reasonable to expect, therefore, that the actual amount of lead released into the benthic environment would be substantially less than predicted in the IFH analysis. Overall, however, torpedo exercises over time may adversely affect benthic HAPC within the USWTR Site B.

2.3.3 Site C—Cherry Point

- **Impacts on Benthic Substrate EFH (not including live/hard bottom)**

Expended material released from torpedo exercises could potentially impact benthic substrate EFH. All torpedoes deployed within the range would be recovered. Forty-eight MK 48 EXTORPs would be released each year at the USWTR. Each MK 48 contains 24 kg (53 lb) of metallic lead ballast, totaling 1,158 kg (2,554 lb), and 76.2 m (250 ft) of thin-gauge copper control wire encased in flex hose. The flex hose would sink along with the copper wire and could have temporary impacts on the benthic substrate EFH as a result of this action.

The MK 46 and MK 54 lightweight torpedoes all release expendable materials when they are air launched. The expendable materials from these torpedoes could potentially have temporary impacts on benthic soft substrates EFH. Forty-eight percent of the approximately 328 lightweight torpedoes used on the USWTR would be MK 46s, and an estimated 10%, or 16 of these would be EXTORPs. Upon completion of an MK 46 EXTORP exercise, two steel-jacketed lead ballast weights would be released to lighten the torpedo, allowing it to rise to the surface for recovery. Therefore, approximately 32 16.8 kg (37 lb) ballasts would be expended annually, totaling 537 kg (1,184 lb) of lead ballast. In addition, 51 MK 46 REXTORPs would be deployed and each uses six ballasts (totaling 82 kg (180 lb) of lead), resulting in the expenditure of 4,164 kg (9,180 lb) of lead ballast. The total amount of lead ballasts used between the MK 48, MK 46 REXTORP and MK 46 EXTORPs would be 5,322 kg (12,918 lb), which could have temporary and minimal impacts the benthic substrate EFH in the immediate vicinity. There are no lead weights associated with the MK 54 EXTORP or REXTORP.

In addition, five VLA rockets would be mounted to MK 46 EXTORPs and while the torpedoes would be recovered, the rockets would not. The closer to the shelf break, the finer the sediments, and the greater the opportunity for these sediments to be disturbed from discarded torpedo material (i.e., 16.8 kg [37 lb] ballasts, rocket airframes, etc. from heavyweight EXTORPs), which increases the ability for disturbed sediments to smother benthic EFH species. Overall, the continued use of the range throughout the year could aggravate the benthic substrate EFH due to discarded material from the exercise torpedoes or the malfunction and scuttling of the torpedoes onto the ocean seabed; however, once lead ballast and flex hose are covered by sediments, anoxic conditions are likely to prevail and subsequent ionizing of lead into the benthic environment would all but cease. It is reasonable to expect, therefore, that the actual amount of lead released into the benthic environment would be substantially less than predicted in the IFH analysis. Given these probable circumstances, exercise torpedoes will not adversely affect benthic substrate (not including live/hard bottom) EFH.

- **Impacts on Live/Hard Bottom EFH**

Forty-eight MK 48 EXTORPs would be released each year at the USWTR range and each contains 24 kg (53 lb) of metallic lead totaling 1,158 kg (2,554 lb). In addition, 76.2 m (250 ft) of thin-gauge copper control wire encased in flex hose would be released and subsequently sink, which could have temporary impacts on the live/hard bottom EFH as a result of this action.

Forty-eight percent of the approximately 328 lightweight torpedoes used on the USWTR would be MK 46s, and an estimated 10%, or 16 of these would be EXTORPs. Upon completion of an MK 46

EXTORP run, two steel jacketed lead ballast weights would be released to lighten the torpedo, allowing it to rise to the surface for recovery. Therefore, approximately 32 16.8 kg (37 lb) ballasts would be expended annually, totaling 537 kg (1,184 lb) of lead ballast. In addition 51 MK 46 REXTORPs would be deployed and each uses six ballasts (totaling 82 kg (180 lb) of lead), resulting in the expenditure of 4,164 kg (9,180 lb) of lead ballast. The total amount of lead ballasts used between the MK 48, MK 46 REXTORP and MK 46 EXTORPs would be 5,322 kg (12,918 lb), which could have long-term, adverse impacts on live/hard bottom EFH in the immediate vicinity by contamination and destruction. The *Lophelia* Reefs located in the northern and southern part of the range along the shelf break are important for snapper-grouper species and are slow growing. Any damage inflicted on these corals (*Lophelia*) from discarded lead ballasts or malfunctioning torpedoes resulting from the proposed action could take decades to centuries for the coral to recover. Therefore, torpedo exercises in the vicinity of USWTR Site C may adversely affect live/hard bottom EFH.

- **Impacts on Artificial Reef EFH**

Ten artificial reefs in the range make up one artificial reef complex (Figure 1-10; Table 1-2). Forty-eight MK 48 EXTORPs would be released each year at the USWTR and each contains 24 kg (53 lb) of metallic lead totaling 1,158 kg (2,554 lb) in addition to 76.2 m (250 ft) of thin-gauge copper control wire encased in flex hose. Although the flex hose would sink along with the copper wire, it could have temporary impacts on the artificial reef substrates as a result of this action until the reef could re-colonize.

Forty-eight percent of the approximately 328 lightweight torpedoes used on the USWTR would be MK 46s, and an estimated 10%, or 16 of these would be EXTORPs. Upon completion of an MK 46 EXTORP run, two steel jacketed lead ballast weights would be released to lighten the torpedo, allowing it to rise to the surface for recovery. Therefore, approximately 32 16.8 kg (37 lb) ballasts would be expended annually, totaling 537 kg (1,184 lb) of lead ballast. In addition 51 MK 46 REXTORPs would be deployed and each uses six ballasts (totaling 82 kg (180 lb) of lead), resulting in the expenditure of 4,164 kg (9,180 lb) of lead ballast. The total amount of lead ballasts used between the MK 48, MK 46 REXTORP and MK 46 EXTORPs would be 5,322 kg (12,918 lb), which could have long-term, adverseimpacts on the artificial reef EFH in the immediate vicinity by destruction. Overall, the continued use of the range throughout the year could aggravate the artificial reefs due to discarded material from the exercise torpedoes or the malfunction and scuttling of the torpedoes onto the artificial reefs; however, the artificial reefs take up such a small amount of space in the range, the likelihood of impacting one is small. Although unlikely, torpedo exercises in the USWTR Site C may adversely affect artificial reef EFH.

- **Impacts on Pelagic *Sargassum* EFH**

Pelagic *Sargassum* can occur in all four proposed USWTR sites and provides EFH for several fish species, particularly the larval lifestage. The exact location of *Sargassum* at any given time within each site is impossible to predict. Exercise torpedoes released into water from either a ship or an aircraft may briefly encounter pelagic *Sargassum* floating at the surface and temporarily disturb *Sargassum* mats. Recovery of exercise torpedoes occurs at the surface and also has the potential to interact with pelagic *Sargassum* EFH. Given the patchy distribution of *Sargassum* and the transient nature of potential interaction, any disturbance would be expected to be temporary and would not adversely affect pelagic *Sargassum* EFH.

- **Impacts on Water Column EFH**

Torpedo exercises conducted in the USWTR would result in the release of chemicals. One hundred percent of the water column is designated as EFH in the proposed USWTR Site C (Table 1-2). All chemical releases, even those associated with a worst-case scenario, would either be temporary and quickly dilute within the water column, or would occur at a slow rate over a long period of time such that high concentrations should not accumulate in the water column. Therefore, no long-term impacts on water column EFH would be anticipated. The following three occurrences of chemical releases have the potential to impact water column EFH and are addressed to assess the magnitude of their impact.

1. Chemicals released as exhaust from EXTORPs equipped with a propulsion system may pose a temporary risk to water column EFH. Most exhaust chemicals occur naturally in seawater; however, one chemical, HCN, does not, and, if in high enough concentrations, could pose a risk to both humans and marine biota. The USEPA national recommendation for cyanide in marine waters is 1 µg/L, or approximately 1 ppb for both acute and chronic criteria (USEPA 2006). MK 46 and MK 54 torpedoes are expected to discharge hydrogen cyanide concentrations of 280 ppb, and MK 48 torpedoes are expected to discharge HCN concentrations ranging from 140 to 150 ppb (Ballentine 1995 and Qadir et al. 1994, as cited in DoN 1996a, 1996b). These initial concentrations are well above the USEPA recommendations for cyanide; however, because it has extremely high solubility in seawater, HCN would diffuse to levels below 1 µg/L within 5.4 m (17.7 ft) of the center of the torpedo's path, and thus should not adversely affect marine organisms or water column EFH (DoN 2008).

2. MK 46, MK 54, and MK 48 torpedoes contain potentially hazardous or harmful (non-propulsion-related) components and materials (DoN 2008). Only very small quantities of these materials, however, are contained in each torpedo. During normal exercise operations, the torpedo is sealed and is recovered at the end of a run; therefore, none of the potentially hazardous or harmful materials would be released to the marine environment. The MK 48 torpedo uses either an SFH or IFH. The IFH is a multi-component design that consists of a stainless-steel spring overlaid with a polyester braid and then a layer of lead tape (DoN 1996b). The entire assembly is then overlaid with a stainless-steel wire braid (DoN 1996b). The SFH is constructed primarily of stainless steel and contains no lead or other materials that may pose a threat to the marine environment (DoN 1996b).

   The Navy estimated the release of lead to the marine environment from the corrosion of the IFH based on a worst-case scenario, assuming low pH and high Eh levels, no sedimentation, no marine growth or oxide buildup on the IFH, and no current or water movement (DoN 1996b). The USEPA national recommended water quality criteria for lead in marine waters are 210 µg/L, or approximately 210 ppb for acute exposure and 8.1 µg/L for chronic exposure (USEPA 2006). Adverse effects from lead exposure are most pronounced at elevated water temperatures and reduced pH, in comparatively soft waters, in younger life stages, and after long exposures (Eisler 1988). Based on this worst-case scenario, the Navy determined that the maximum distance from the IFH in which the average concentration of lead in seawater may be toxic to marine life would be 15.6 cm (6.1 in) (DoN 1996b). Organisms that are within this distance of the IFH may be exposed to short-term lead levels that are above the USEPA acute toxicity water quality criteria for seawater aquatic life, which is 0.210 ppm.

   On the ocean bottom in the USWTR, however, the reaction of the IFH with the marine environment would be retarded because the usual bottom conditions are slightly basic, with a lower pH and lower temperature. Over time the cable would be increasingly less exposed to the full marine environment because of sedimentation, marine growth, and oxide coatings. It is reasonable to expect, therefore, that the actual average amount of lead released into seawater would be substantially less than this study predicts, and the lead that is released would be dispersed at a much higher rate than predicted.

   The increased lead concentration over the entire extent of the USWTR appears insignificant. Because the low amounts of lead released to the marine environment are below concentrations that could adversely affect marine life, the lead contained in the IFH would pose no environmental threat to marine mammals, threatened/endangered species, or the marine environment, inclusive of fish and invertebrates. In addition, the release of IFHs at USWTR Site C should not cause significant harm to water column EFH.

Further, upon completion of a MK 46 EXTORP run, two steel-jacketed lead ballast weights are released to lighten the torpedo, allowing it to rise to the surface for recovery. Each ballast weighs 16.8 kg (37 lb) and sinks rapidly to the bottom. Approximately 32 16.8 kg (37-lb) ballasts would be expended annually, totaling 537 kg (1,184 lb) of lead ballast. In addition to the ballasted MK 46 EXTORPs, MK 46 REXTORPs launched from P-3s also must be ballasted for safety purposes. Ballast weights for these REXTORPs are similarly released to allow for torpedo recovery. Ballasting the MK 46 REXTORP for P-3 use requires six ballasts, totaling 82 kg (180 lb) of lead. It is estimated that a maximum of 51 MK 46 EXTORPs would be launched by P-3s, resulting in the expenditure of 4,164 kg (9,180 lb) of lead ballast. In areas of soft bottom, ballasts would be buried quickly in the sediments.

The USEPA saltwater quality standard for lead is 8.1 µg/L continuous and 210 µg/L maximum (USEPA 2006). Lead is a minor constituent of seawater, with a background concentration of 0.02 to 0.4 µg/L (Kennish 1989).

The metallic lead of the ballast weights is unlikely to mobilize into the sediment or water as lead ions for three reasons. First, the lead is jacketed with steel, which means that the surface of the lead would not be exposed directly to the actions of seawater. Second, even if the lead were exposed, the general bottom conditions are slightly basic with low oxygen content (i.e., a reducing environment) and would prohibit the lead from ionizing. In addition, only a small percentage of lead is soluble in seawater. Finally, in soft-bottom areas, the lead weights would be buried due to the velocity of their impact with the bottom. Sediments are generally anoxic and thus no lead would be ionized (DoN 1996a). Studies at other ranges have shown the impact of lead ballasts to be minimal, as they are buried deep in sediments where they are not biologically available (Environmental Sciences Group 2005). There would be no cumulative effects from the lead ballasts due to the low probability of mobilization. Therefore, the lead ballasts released at USWTR Site C will not adversely affect water column EFH.

3. Under the worst-case scenario of a catastrophic failure of an EXTORP, up to 27 kg (59 lb) of OTTO Fuel II could be released from a MK 46 or MK 54 torpedo, or up to 152 to 203 kg (335 to 448 lb) from a MK 48 torpedo (DoN 2008). While OTTO Fuel II levels generally should not exceed 0.5 mg/L to prevent toxicity to marine organisms (DiSalvo et al. 1976), it is anticipated that even in the event of such a maximum potential spill, no long-term adverse impacts to the marine environment would result, because:
   - The water volume, depth, and ocean currents of the USWTR would dilute the spill.
   - Five types of common marine bacteria (*Pseudomonas, Flavobacterium, Vibrio, Achromobacter,* and *Arthrobacter*) that exist at all proposed USWTR sites attack and ultimately break down OTTO fuel (DoN 2008).

   Therefore, the use of EXTORPs at USWTR Site C will not adversely affect water column EFH.

- **Impacts on Currents EFH**

Although surface currents and other circulation features occur at varying spatial and temporal scales throughout the region, the most dominant oceanographic feature in the region is the Gulf Stream. The Gulf Stream is a dynamic feature that undergoes constant fluctuations in its physical properties, including its spatial dimensions. The entire range overlaps with the Gulf Stream (Figure 1-11; Table 1-2).

Torpedo exercises conducted at the USWTR should not impact EFH associated with the Gulf Stream since none of the proposed operations should reduce the suitability of the Gulf Stream to function as

EFH. Torpedoes and expendable equipment would only reside within current for a brief period of time after which they would either be recovered or sink to the seafloor. Torpedo exercises conducted at the proposed USWTR Site C will not adversely affect currents EFH.

- **Impacts on Nearshore EFH**

No adverse effects on nearshore EFH is anticipated from torpedo exercises conducted at the proposed USWTR Site C, because the range would be located over 86 km (47 NM) from shore and would not overlap with any nearshore EFH.

- **Impacts on HAPC**

HAPC within the proposed USWTR Site C consist primarily of pelagic *Sargassum* (Figure 1-12) and live/hard bottom communities. The first habitat type is limited to surface waters and the second is benthic HAPC. The potential impacts on each of these habitats have been assessed previously in this section.

No adverse effect on pelagic *Sargassum* HAPC is anticipated from torpedo exercises conducted at the proposed USWTR Site C (see section above). Potential impacts on benthic HAPC are primarily associated with the materials and equipment expended during the torpedo exercises. Two types of torpedoes would be used at the USWTR, the heavyweight MK 48 EXTORP and the lightweight MK 46 and MK 54 torpedoes. Expended materials and equipment include control wire, flex hose (IFH or SFH), air launch accessories, and lead ballast. All of the 328 torpedoes estimate for use at the USWTR annually are planned for recovery immediately following each exercise and should not pose a significant impact on HAPC. An estimated 48 control wires and flex hoses would be released into the USWTR each year, and could potentially cover HAPC after sinking to the seafloor. It is anticipated that up to 5,322 kg (12,918 lb) of lead ballast from MK 48, MK 46 EXTORP and REXTORP torpedoes would be expended per year in the USWTR. These steel-encased lead ballasts would sink rapidly to the seafloor and could damage HAPC upon impact with hard substrate. Furthermore, if the steel casing becomes cracked or otherwise damaged, the rate of corrosion and subsequent release of lead into the immediate benthic environment could result in some level of lead contamination to benthic HAPC, particularly if the lead ballast is permitted to accumulate in the immediate vicinity of benthic HAPC over a period of years.

No information is available on the areal extent of HAPC bottom area in the range. Given that the area of the range at Site C is 1,639 km^2 (478 NM^2) and only a relatively small amount of the proposed USWTR Site C and adjacent trunk cable corridor are designated as such (Figure 1-12; Table 1-2), the probability of expendable materials settling on HAPC would be low.

Regarding potential lead contamination of benthic HAPC, organisms that are within the immediate vicinity (~ 15.6 cm [~ 6.14 in]) based on an analysis of lead in the flex hose assembly may be exposed to short-term lead levels that are above the USEPA acute toxicity water quality criteria for seawater aquatic life, which is 0.140 ppm (DoN 1996b). On the ocean bottom in the USWTR, however, the reaction of the lead ballast and the IFH with the marine environment would be retarded because the usual bottom conditions are slightly basic, with a lower Eh and lower temperature. Also, over time the ballast and flex hose would be increasingly less exposed to the full marine environment because of sedimentation, marine growth, and oxide coatings. Once sediments cover lead ballast and flex hose, anoxic conditions are likely to prevail and subsequent ionizing of lead into the benthic environment would all but cease. It is reasonable to expect, therefore, that the actual amount of lead released into the benthic environment would be substantially less than predicted in the IFH analysis. Overall, however, torpedo exercises over time may adversely affect benthic HAPC within the USWTR Site C.

2.3.4 Site D—VACAPES

- **Impacts on Benthic Substrate EFH (not including live/hard bottom substrate)**

  Impacts on the benthic substrate EFH could come from torpedoes expended material. All torpedoes deployed within the range are planned to be recovered. Forty-eight MK 48 EXTORPs would be released each year at the USWTR and each contains 24 kg (53 lb) of metallic lead totaling 1,158 kg (2,554 lb) in addition to 76.2 m (250 ft) of thin-gauge copper control wire encased in flex hose. The flex hose would sink along with the copper wire, and could alter the benthic substrate, thus causing temporary impacts on the benthic substrate EFH as a result of this action.

  The MK 46 and MK 54 lightweight torpedoes all have expendable materials when they are air launched. The expendable materials from these torpedoes could have temporary impacts on benthic substrate EFH. Forty-eight percent of the approximately 328 lightweight torpedoes used on the USWTR would be MK 46s, and an estimated 10%, or 16 of these would be EXTORPs. Upon completion of an MK 46 EXTORP run, two steel jacketed lead ballast weights would be released to lighten the torpedo, allowing it to rise to the surface for recovery. Therefore, approximately 32 16.8 kg (37 lb) ballasts would be expended annually, totaling 537 kg (1,184 lb) of lead ballast. In addition, 51 MK 46 REXTORPs would be deployed and each uses six ballasts (totaling 82 kg (180 lb) of lead), resulting in the expenditure of 4,164 kg (9,180 lb) of lead ballast. The total amount of lead ballasts used between the MK 48, MK 46 REXTORP and MK 46 EXTORPs would be 5,322 kg (12,918 lb), which could have temporary and minimal impacts the benthic substrate EFH in the immediate vicinity. There are no lead weights associated with the MK 54 EXTORP or REXTORP.In addition, five VLA rockets would be mounted to MK 46 EXTORPs and while the torpedoes would be recovered the rockets would not. The closer to the shelf break within the range, the finer the sediment and the more opportunity for the sediments to be disturbed from discarded torpedoes material (i.e., 16.8 kg (37 lb) ballasts, rocket airframes, etc. from heavyweight EXTORPs) and smother benthic EFH species. Overall, the continued use of the range throughout the year could aggravate the benthic substrate EFH due to discarded material from the exercise torpedoes or the malfunction and scuttling of the torpedoes onto the ocean seabed but no significant impacts would result from this action; however, once lead ballast and flex hose are covered by sediments, anoxic conditions are likely to prevail and subsequent ionizing of lead into the benthic environment would all but cease. It is reasonable to expect, therefore, that the actual amount of lead released into the benthic environment would be substantially less than predicted in the IFH analysis. Given these probable circumstances, exercise torpedoes will not adversely affect benthic substrate (not including live/hard bottom) EFH.

- **Impacts on Live/Hard Bottom EFH**

  All torpedoes deployed within the range are planned to be recovered. Forty-eight MK 48 EXTORPs would be released each year at the USWTR and each contains 24 kg (53 lb) of metallic lead totaling 1,158 kg (2,554 lb) in addition to 76.2 m (250 ft) of thin-gauge copper control wire encased in flex hose. The flex hose would sink along with the copper wire, and could have temporary but no significant impacts on the live/hard bottom EFH (shipwrecks) as a result of this action.

  The MK 46, MK 50, and MK 54 lightweight torpedoes all have expendable materials when they are air launched. The expendable materials from these torpedoes could have temporary impacts on benthic substrate EFH. Forty-eight percent of the approximately 328 lightweight torpedoes used on the USWTR would be MK 46s, and an estimated 10%, or 16 of these would be EXTORPs. Upon completion of an MK 46 EXTORP run, two steel jacketed lead ballast weights would be released to lighten the torpedo, allowing it to rise to the surface for recovery. Therefore, approximately 32 16.8 kg (37 lb) ballasts would be expended annually, totaling 537 kg (1,184 lb) of lead ballast. In addition 51 MK 46 REXTORPs would be deployed and each uses six ballasts (totaling 82 kg (180 lb) of lead), resulting in the expenditure of 4,164 kg (9,180 lb) of lead ballast. The total amount of lead ballasts used between the MK 48, MK 46 REXTORP and MK 46 EXTORPs would be 5,322 kg (12,918 lb) which could temporarily impact the live/hard bottom EFH (shipwrecks) in the immediate vicinity by contamination as a result of this action; however, once the discarded lead is covered by bottom sediments, anoxic conditions would significantly reduce decay and release rates, and no adverse effects would occur as a result of this action.

In addition, five VLA rockets would be mounted to MK 46 EXTORPs and while the torpedoes would be recovered the rockets would not. The closer to the shelf break within the range, the finer the sediments, and the more opportunity for the sediments to be disturbed from discarded torpedoes material (i.e., 16.8 kg (37 lb) ballasts, rocket airframes, etc. from heavyweight EXTORPs), which would increase the potential for smothering benthic EFH species. Overall, the continued use of the range throughout the year could aggravate the live/hard bottom EFH (shipwrecks) due to discarded material from the exercise torpedoes or the malfunction and scuttling of the torpedoes onto the ocean seabed. However, due to fact that only a single shipwreck is located within the USWTR Site D (Figure 1-13; Table 1-2), exercise torpedoes will not adversely affect live/hard bottom EFH.

- **Impacts on Artificial Reef EFH**

There is no known artificial reef EFH located in the vicinity of the proposed USWTR Site D (Figure 1-14) and therefore no adverse effects on artificial reef EFH would occur.

- **Impacts on Pelagic *Sargassum* EFH**

Pelagic *Sargassum* can occur in all four proposed USWTR sites and provides EFH for several fish species, particularly the larval lifestage. The exact location of *Sargassum* at any given time within each site is impossible to predict. Exercise torpedoes released into water from either a ship or an aircraft may briefly encounter pelagic *Sargassum* floating at the surface and temporarily disturb *Sargassum* mats. Recovery of exercise torpedoes occurs at the surface and also has the potential to interact with pelagic *Sargassum* EFH. Given the patchy distribution of *Sargassum* and the transient nature of potential interaction, any disturbance would be expected to be temporary and would not adversely affect pelagic *Sargassum* EFH.

- **Impacts on Water Column EFH**

Torpedo exercises conducted in the USWTR would result in the release of chemicals. One hundred percent of the water column is designated as EFH in the Site D USWTR. All chemical releases, even those associated with a worst-case scenario, would either be temporary and quickly dilute within the water column, or would occur at a slow rate over a long period of time such that high concentrations should not accumulate in the water column. Therefore, no long-term impacts on water column EFH would be anticipated. The following three occurrences of chemical releases have the potential to impact water column EFH and are addressed to assess the magnitude of their impact.

1. Chemicals released as exhaust from EXTORPs equipped with a propulsion system may pose a temporary risk to water column EFH. Most exhaust chemicals occur naturally in seawater; however, one chemical, HCN, does not, and, if in high enough concentrations, could pose a risk to both humans and marine biota. The USEPA national recommendation for cyanide in marine waters is 1 µg/L, or approximately 1 ppb for both acute and chronic criteria (USEPA 2006). MK 46 and MK 54 torpedoes are expected to discharge HCN concentrations of 280 ppb, and MK 48 torpedoes are expected to discharge HCN concentrations ranging from 140 to 150 ppb (Ballentine 1995 and Qadir et al. 1994, as cited in DoN 1996a, 1996b). These initial concentrations are well above the USEPA recommendations for cyanide; however, because it has extremely high solubility in seawater, hydrogen cyanide would diffuse to levels below 1 µg/L within 5.4 m (17.7 ft) of the center of the torpedo's path, and thus should not adversely affect marine organisms or water column EFH (DoN 2008).

2. MK 46, MK 54, and MK 48 torpedoes contain potentially hazardous or harmful (non-propulsion-related) components and materials (DoN 2008). Only very small quantities of these materials, however, are contained in each torpedo. During normal exercise operations, the torpedo is sealed and is recovered at the end of a run; therefore, none of the potentially hazardous or harmful materials would be released to the marine environment. The MK 48 torpedo uses either an SFH or IFH. The IFH is a multi-component design that consists of a stainless-steel spring overlaid with a polyester braid and then a layer of lead tape (DoN 1996b). The entire assembly is then overlaid with a stainless-steel wire braid (DoN 1996b). The SFH is constructed primarily of stainless steel and contains no lead or other materials that may pose a threat to the marine environment (DoN 1996b).

The Navy estimated the release of lead to the marine environment from the corrosion of the IFH based on a worst-case scenario, assuming low pH and high Eh levels, no sedimentation, no marine growth or oxide buildup on the IFH, and no current or water movement (DoN 1996b). The USEPA national recommended water quality criteria for lead in marine waters are 210 µg/L, or approximately 210 ppb for acute exposure and 8.1 µg/L for chronic exposure (USEPA 2006). Adverse effects from lead exposure are most pronounced at elevated water temperatures and reduced pH, in comparatively soft waters, in younger life stages, and after long exposures (Eisler 1988). Based on this worst-case scenario, the Navy determined that the maximum distance from the IFH in which the average concentration of lead in seawater may be toxic to marine life would be 15.6 cm (6.1 in) (DoN, 1996b). Organisms that are within this distance of the IFH may be exposed to short-term lead levels that are above the USEPA acute toxicity water quality criteria for seawater aquatic life, which is 0.210 ppm.

On the ocean bottom in the USWTR, however, the reaction of the IFH with the marine environment would be retarded because the usual bottom conditions are slightly basic, with a lower pH and lower temperature. Over time, the cable would be increasingly less exposed to the full marine environment because of sedimentation, marine growth, and oxide coatings. It is reasonable to expect, therefore, that the actual average amount of lead released into seawater would be substantially less than this study predicts, and the lead that is released would be dispersed at a much higher rate than predicted.

The increased lead concentration over the entire extent of the USWTR appears insignificant. Because the low amounts of lead released to the marine environment are below concentrations that could adversely affect marine life, the lead contained in the IFH would pose no environmental threat to marine mammals, threatened/endangered species, or the marine environment, inclusive of fish and invertebrates. In addition, the release of IFHs at USWTR Site D should not cause significant harm to water column EFH.

Further, upon completion of a MK 46 EXTORP run, two steel-jacketed lead ballast weights are released to lighten the torpedo, allowing it to rise to the surface for recovery. Each ballast weighs 16.8 kg (37 lb) and sinks rapidly to the bottom. Approximately 32 16.8 kg (37-lb) ballasts would be expended annually, totaling 537 kg (1,184 lb) of lead ballast. In addition to the ballasted MK 46 EXTORPs, MK 46 REXTORPs launched from P-3s also must be ballasted for safety purposes. Ballast weights for these REXTORPs are similarly released to allow for torpedo recovery. Ballasting the MK 46 REXTORP for P-3 use requires six ballasts, totaling 82 kg (180 lb) of lead. It is estimated that a maximum of 51 MK 46 EXTORPs would be launched by P-3s, resulting in the expenditure of 4,164 kg (9,180 lb) of lead ballast. In areas of soft bottom, ballasts would be buried quickly in the sediments.

The USEPA saltwater quality standard for lead is 8.1 µg/L continuous and 210 µg/L maximum (USEPA 2006). Lead is a minor constituent of seawater, with a background concentration of 0.02 to 0.4 µg/L (Kennish 1989).

The metallic lead of the ballast weights is unlikely to mobilize into the sediment or water as lead ions for three reasons. First, the lead is jacketed with steel, which means that the surface of the lead would not be exposed directly to the actions of seawater. Second, even if the lead were exposed, the general bottom conditions are slightly basic with low oxygen content (i.e., a reducing environment) and would prohibit the lead from ionizing. In addition, only a small percentage of lead is soluble in seawater. Finally, in soft-bottom areas, the lead weights would be buried due to the velocity of their impact with the bottom. Sediments are generally anoxic and thus no lead would be ionized (DoN 1996a). Studies at other ranges have shown the impact of lead ballasts to be minimal, as they are buried deep in sediments where they are not biologically available (Environmental Sciences Group 2005). There would be no cumulative effects from the lead ballasts due to the low probability of mobilization. Therefore, the lead ballasts released at USWTR Site D will not adversely affect water column EFH.

3. Under the worst-case scenario of a catastrophic failure of an EXTORP, up to 27 kg (59 lb) of OTTO Fuel II could be released from a MK 46 or MK 54 torpedo, or up to 152 to 203 kg (335 to 448 lb) from a MK 48 torpedo (DoN 2008). While OTTO Fuel II levels generally should not exceed 0.5 mg/L to prevent toxicity to marine organisms (DiSalvo et al. 1976), it is anticipated that even in the event of such a maximum potential spill, no long-term adverse impacts to the marine environment would result, because:

   - The water volume, depth, and ocean currents of the USWTR would dilute the spill.
   - Five types of common marine bacteria (*Pseudomonas, Flavobacterium, Vibrio, Achromobacter,* and *Arthrobacter*) that exist at all proposed USWTR sites attack and ultimately break down OTTO fuel (DoN 2008).

   Therefore, the use of EXTORPs at USWTR Site D will not adversely affect water column EFH.

- **Impacts on Currents EFH**

  No currents are designated as EFH in the vicinity of the proposed USWTR Site D and therefore no adverse effects on currents EFH would occur.

- **Impacts on Nearshore EFH**

  No adverse effects on nearshore EFH would be anticipated from torpedo exercises conducted at the proposed USWTR Site D, because the range would be located over 63 km (34 NM) from shore and would not overlap with any nearshore EFH.

- **Impacts on HAPC**

  No HAPC are designated within the vicinity of the proposed USWTR Site D and therefore no adverse effects on HAPCs would occur.

2.4 Range Operation—Sensing Devices, Countermeasures, and Targets

2.4.1 Site A—Jacksonville

- **Impacts on Benthic Substrate EFH (not including live/hard bottom)**

  Various countermeasures would be deployed such as acoustic device countermeasures that weigh between 3 and 57 kg (7 and 125 lb), with a diameter of 8 to 15 cm (3 to 6 in) and a length of 102 to 280 cm (40 to 110 in). Throughout the year 3,000 sonobuoys, including expendable bathythermographs (XBTs), would be deployed within the range that weigh 6 to 18 kg (14 to 39 lb) and are 12.5 cm (4.9 in) in diameter and 91 cm (36 in) in length. Sonobuoys contain lead chloride batteries, parachutes for deployment, exterior cases, and sea anchors. The maximum seafloor area covered by sonobuoys settling on the bottom was estimated by multiplying the typical length of a sonobuoy (91 cm [36 in]) by the diameter (12.5 cm [4.9 in]) to obtain a footprint of 1,135 cm^2 (176 in^2), or 0.11 m^2 (1.2 ft^2). This number, multiplied by 3,000 (the estimated number of sonobuoys used per year) provides an estimated overall sonobuoy coverage of 330 m^2 (3,552 ft^2). The USWTR Site A seafloor would encompass an area of 1,535 km^2 (448 NM^2), the total coverage of the USWTR by sonobuoys would be 0.00002% of the USWTR seafloor annually. The sonobuoys, as well as other devices left in place in the USWTR, would degrade, corrode, and become incorporated into the sediments, but initially would lie on the sediment, effectively changing soft bottom to hard bottom. This initial settling before erosion could have temporary and no more than minimal impacts on benthic EFH substrate as a result of this action.

The chemical components of concern contained in the three different types of batteries used to power sonobuoys are lead, silver, and copper. A study conduced by the Department of the Navy (DoN) investigated the effect of the release of these chemicals under various scenarios on the marine environment and concluded that the chemicals would quickly be dispersed within the water column and would not significantly impact the water quality for the benthic environment (DoN 1993). Between the chemical components and physical structure of the sensing devices, the use of sonobuoys and XBTs will not adversely affect benthic substrate (not including live/hard bottom) EFH.

The two different target simulators (MK 30 anti-submarine warfare [ASW] and MK 39) that would be used in the range are very different in size and recoverability thus their impacts on the benthic substrates EFH would be different. The MK 30 ASW target simulator (planned for recovery, 60 deployed per year) is a torpedo-sized electrically propelled target that weighs 1,224 kg (2,700 lb) and has a length of 6.2 m (20 ft). Although it is a recoverable unit it still has the potential to malfunction and scuttle, thus impacting benthic substrate EFH in the range. While the likelihood of this happening would be minimal, should it occur, impacts on benthic substrate EFH as a result of this action would be temporary.

The MK 39 target simulator (50 deployed per year) is not as large as the MK 30 and weighs 9.6 kg (21 lb) and is 12.4 by 91.4 cm (4.9 by 36 in) in length. The potential impacts from the MK 39 is the fact that it is not recoverable and contains 30.5 m (100 ft) of wire, lithium batteries, and a parachute that sinks. It is preprogrammed to run for several hours after which time it scuttles. Once it scuttles and falls upon benthic substrate EFH in the range, the heavier components potentially can impact this area by disturbing the fine sediments thus causing a siltation effect potentially impacting benthic species in the vicinity. The lighter components such as the parachute could temporarily smother benthic species in the vicinity before it eroded but would not have more than minimal impacts as a result of this action. Therefore, the use of countermeasures and targets on USWTR Site A will not adversely affect benthic substrate (not including live/hard bottom) EFH.

Overall, the use of sensing devices, countermeasures, and targets on the USWTR Site A will not cause significant harm to the benthic substrate (not including live/hard bottom) EFH.

- **Impacts on Live/Hard Bottom EFH**

Various countermeasures would be deployed such as acoustic device countermeasures that weigh between 3 and 57 kg (7 and 125 lb), with a diameter of 8 to 15 cm (3 to 6 in) and a length of 102 to 280 cm (40 to 110 in). Throughout the year 3,000 sonobuoys including XBTs would be deployed within the range that weigh 6 to 18 kg (14 to 39 lb) and are 12.5 cm (4.9 in) in diameter and 91 cm (36 in) in length. Sonobuoys contain lead chloride batteries, parachutes for deployment, exterior cases, and sea anchors.

The maximum seafloor area covered by sonobuoys settling on the bottom was estimated by multiplying the typical length of a sonobuoy (91 cm [36 in]) by the diameter (12.5 cm [4.9 in]) to obtain a footprint of 1,135 cm^2 (176 in^2), or 0.11 m^2 (1.2 ft^2). This number, multiplied by 3,000 (the estimated number of sonobuoys used per year) provides an estimated overall sonobuoy coverage of 330 m^2 (3,552 ft^2). The USWTR seafloor would encompass an area of 1,535 km^2 (448 NM^2), the total coverage of the USWTR by sonobuoys would be 0.00002% of the USWTR seafloor annually. The sonobuoys, as well as other devices left in place in the USWTR, would degrade and corrode over time. However, if the sonobuoys fell on top of *Lophelia* reefs, or other fragile live bottom habitats, the impact on the live/hardbottom communities as a result of this action could be more adverse. As a result, the use of sensing devices such as sonobuoys and XBTs on the USWTR Site A may adversely affect the live/hard bottom EFH.

The chemical components of concern contained in the three different types of batteries used to power sonobuoys are lead, silver, and copper. A study conduced by the DoN investigated the effect of the release of these chemicals under various scenarios on the marine environment and concluded that the chemicals would quickly be dispersed within the water column and would not significantly impact the water quality or the benthic environment (DoN 1993).

The two different target simulators (MK 30 ASW and MK 39) that would be used in the range are very different in size and recoverability. The MK 30 ASW target simulator (planned for recovery, 60 deployed per year) is a torpedo-sized electrically propelled target that weighs 1,224 kg (2,700 lb) and has a length of 6.2 m (20 ft). Although it is a recoverable unit it still has the potential to malfunction and scuttle thus potentially impacting live/hard bottom EFH in the range. While likelihood of this happening is minimal, should it occur, impacts on live/hard bottom EFH may result.

The MK 39 target simulator (50 deployed per year) is not as large as the MK 30 and weighs 9.6 kg (21 lb) and is 12.4 by 91.4 cm (4.9 by 36 in) in length. The MK 39 is pre-programmed to run for several hours after which time it scuttles. Since the MK 39 would not be recovered, potential impacts arise from the 30.5 m (100 ft) of wire, lithium batteries, and a parachute that are associated with the simulator and would sink. Impacts from the associated MK 39 debris may impact live/hard bottom EFH by physically hitting and damaging coral or live/hard bottom communities when sunk, covering (smothering) the habitat, or degrading the habitat from leakage of the batteries. Once scuttled, the MK 39 falls to the ocean bottom where it may land on to a live bottom community and damage the EFH. Consequently, the use of countermeasures and targets on the USWTR Site A may adversely affect the live/hard bottom EFH.

Overall, the use of sensing devices, countermeasures, and targets on the USWTR Site A may adversely affect the live/hard bottom EFH.

- **Impacts on Artificial Reefs EFH**

  There are no known artificial reefs (and thus no EFH) in the proposed USWTR Site A range; therefore the use of sensing devices, countermeasures, and targets will not adversely affect artificial reef EFH.

- **Impacts on Pelagic *Sargassum* EFH**

  Pelagic *Sargassum* occurs in all three proposed sites and serves as EFH for several fish species, particularly the larval lifestage. The exact location of *Sargassum* at any given time within each site is impossible to predict. Sensing devices (e.g., sonobuoys), countermeasures, and targets released into the water from either a ship or an aircraft may briefly encounter pelagic *Sargassum* floating at the surface and temporarily disturb *Sargassum* mats. Given the patchy distribution of *Sargassum* and the transient nature of the potential impact, the use of sensing devices, countermeasures, and targets at the USWTR Site A will not adversely affect pelagic *Sargassum* EFH.

- **Impacts on Water Column EFH**

  Water column EFH consists of 100% of the water column within the proposed USWTR Site A. Chemicals would be introduced into the water column with the release and expenditure of various types of sensing devices, countermeasures, and targets. An estimated 132 XBTs and 3,000 sonobuoys would be released per year in the USWTR and would quickly sink to the seafloor to breakdown over time. XBTs do not use batteries and do not contain any potentially hazardous materials. Sonobuoys can use three different types of batteries, each of which releases one of the following chemicals of concern: lead, silver, or copper.

The concentration of each chemical within the water column over the lifetime of the battery was modeled, and it is estimated that concentrations would be well below federal water quality limits throughout the water column (DoN 1993). Therefore, the release of sonobuoys and XBTs on USWTR Site A will not adversely affect water column EFH.

Countermeasures and targets use lithium sulfur dioxide ($LiSO_2$) batteries. The chemical constituents that result from the breakdown of the batteries are commonly found in seawater and pose no risk to the natural environment. Any elevated concentrations that exist in the immediate vicinity of a battery would only be temporary and would be diluted by the action of currents (DoN 1993). Therefore, the use of countermeasures and targets on USWTR Site A will not adversely affect water column EFH.

- **Impacts on Currents EFH**

  Although surface currents and other circulation features occur at varying spatial and temporal scales throughout the region, the most dominant oceanographic feature in the region is the Gulf Stream. The Gulf Stream is a dynamic feature that undergoes constant fluctuations in its physical properties, including its spatial dimensions. The entire range at the proposed USWTR Site A overlaps with the Gulf Stream (Figure 1-3; Table 1-2). Sensing devices, counter measures, and targets expended into the range would only reside within Gulf Stream for a brief period of time after which they would sink to the seafloor. The release of sensing devices, counter measures, and targets at the USWTR should not impact EFH associated with the Gulf Stream since none of the proposed operations should reduce the suitability of the Gulf Stream to function as EFH. Therefore, the use of sensing devices, countermeasures, and targets at the USWTR Site A will not adversely affect currents EFH.

- **Impacts on Nearshore EFH**

  The release of sensing devices, counter measures, and targets at the USWTR Site A will not adversely affect nearshore EFH since the range would be located over 93 km (50 NM) from shore and would not be located near any nearshore habitat.

- **Impacts on HAPC**

  HAPC within the proposed USWTR Site A consist primarily of pelagic *Sargassum* (Figure 1-4) and live/hard bottom communities. The first habitat type is limited to surface waters and the second is benthic HAPC. The potential impacts on each of these habitats have been assessed previously in this section.

  The release of sensing devices, countermeasures, and targets at the proposed USWTR Site A will not adversely affect pelagic *Sargassum* HAPC (see section above). Potential impacts on benthic HAPC are primarily associated with expended sonobuoys, countermeasures, and targets. It is estimated that 3,000 sonobuoys, 35 acoustic device countermeasures (ADCs), and 50 expendable mobile anti-submarine warfare training targets (EMATTs) would be used annually. Additionally, 132 XBTs would be used and expended in the USWTR per year. The area of benthic substrate designated as HAPC is unknown. One hundred forty-six HAPC are located within the boundary of the proposed Site A range (Figure 1-4; Table 1-2). The probability of expended sonobuoys, countermeasures, and targets settling on HAPC is considered low given that the HAPC are consolidated into a narrow band within the range; however, if the expended materials are released disproportionately over the section of the range within high numbers of HAPC, then more than minimal adverse impacts could occur over time.

Over time, the sonobuoys, as well as the other devices left in place in the USWTR, would be expected to degrade, corrode, and become incorporated into the sediments. Chemical contamination of benthic HAPC from expended batteries used in sonobuoys, countermeasures, and targets poses a potential impact on benthic HAPC. The concentrations of lead, silver, and copper (the three chemicals of concern in sonobuoy batteries) should be well below federal water quality limits throughout the entire water column, and it is reasonable to extend this expectation to chemicals released at the interface of the water column and benthic HAPC. The chemicals released from the degradation of $LiSO_2$ batteries are commonly found in sea water and would pose no risk to the natural environment (DoN 1993). Overall, however, due to the number of devices deployed and to the sensitive nature of the habitat, the use of sensing devices, countermeasures, and targets at the USWTR Site A may adversely affect benthic HAPC.

2.4.2 Site B—Charleston

- **Impacts on Benthic Substrate EFH (not including live/hard bottom)**

Various countermeasures would be deployed such as acoustic device countermeasures that weigh between 3 and 57 kg (7 and 125 lb), with a diameter of 8 to 15 cm (3 to 6 in) and a length of 102 to 280 cm (40 to 110 in).

Throughout the year 3,000 sonobuoys including XBTs would be deployed within the range that weigh 6 to 18 kg (14 to 39 lb) and are 12.5 cm (4.9 in) in diameter and 91 cm (36 in) in length. Sonobuoys contain lead chloride batteries, parachutes for deployment, exterior cases, and sea anchors. The maximum seafloor area covered by sonobuoys settling on the bottom was estimated by multiplying the typical length of a sonobuoy (91 cm [36 in]) by the diameter (12.5 cm [4.9 in]) to obtain a footprint of 1,135 cm^2 (176 in^2), or 0.11 m^2 (1.2 ft^2). This number, multiplied by 3,000 (the estimated number of sonobuoys used per year) provides an estimated overall sonobuoy coverage of 330 m^2 (3,552 ft^2). The USWTR seafloor would encompass an area of 1,471 km^2 (428 NM^2), the total coverage of the USWTR by sonobuoys would be 0.00002% of the USWTR seafloor annually. The sonobuoys, as well as other devices left in place in the USWTR, would degrade, corrode, and become incorporated into the sediments but initially would lie on the sediment and change soft bottom to hard bottom. This initial settling before erosion could have temporary and no more than minimal impacts on benthic EFH substrate as a result of this action.

The chemical components of concern contained in the three different types of batteries used to power sonobuoys are lead, silver, and copper. A study conduced by the DoN investigated the effect of the release of these chemicals under various scenarios on the marine environment and concluded that the chemicals would quickly be dispersed within the water column and would not significantly impact the water quality for the benthic environment (DoN 1993). Between the chemical components and physical structure of the sensing devices, the use of sonobuoys and XBTs at USWTR Site B will not adversely affect benthic substrate (not including live/hard bottom) EFH.

The two different target simulators (MK 30 ASW and MK 39) that would be used in the range are very different in size and recoverability thus their impacts on the benthic substrates EFH would be different. The MK 30 ASW target simulator (planned for recovery, 60 deployed per year) is a torpedo-sized electrically propelled target that weighs 1,224 kg (2,700 lb) and has a length of 6.2 m (20 ft). Although it is a recoverable unit it still has the potential to malfunction and scuttle thus impacting benthic substrate EFH in the range. While the likelihood of this happening would be minimal, should it occur, impacts on benthic substrate EFH as a result of this action would be temporary.The MK 39 target simulator (50 deployed per year) is not as large as the MK 30 and weighs 9.6 kg (21 lb) and is 12.4 by 91.4 cm (4.9 by 36 in) in length. The potential impacts from the MK 39 is the fact that it is not recoverable and contains 30.5 m (100 ft) of wire, lithium batteries, and a parachute that sinks. It is preprogrammed to run for several hours after which time it scuttles. Once it scuttles and falls upon benthic substrate EFH in the range, the heavier components potentially can impact this area by disturbing the fine sediments thus causing a siltation effect potentially impacting benthic species in the vicinity. The lighter components such as the parachute could temporarily smother benthic species in the vicinity causing temporary impacts until the parachute eroded but no significant impacts would result from this action. Therefore, the use of countermeasures and targets on USWTR Site B will not adversely affect benthic substrate (not including live/hard bottom) EFH.

Overall, the use of sensing devices, countermeasures, and targets on the USWTR Site B will not adversely affect benthic substrate (not including live/hard bottom) EFH.

- **Impacts on Live/Hard Bottom EFH**

Various countermeasures would be deployed such as acoustic device countermeasures that weigh between 3 and 57 kg (7 and 125 lb), with a diameter of 8 to 15 cm (3 to 6 in) and a length of 102 to 280 cm (40 to 110 in).

Throughout the year 3,000 sonobuoys including XBTs would be deployed within the range that weigh 6 to 18 kg (14 to 39 lb) and are 12.5 cm (4.9 in) in diameter and 91 cm (36 in) in length. Sonobuoys contain lead chloride batteries, parachutes for deployment, exterior cases, and sea anchors. The maximum seafloor area covered by sonobuoys settling on the bottom was estimated by multiplying the typical length of a sonobuoy (91 cm [36 in]) by the diameter (12.5 cm [4.9 in]) to obtain a footprint of 1,135 cm^2 (176 in^2), or 0.11 m^2 (1.2 ft^2). This number, multiplied by 3,000 (the estimated number of sonobuoys used per year) provides an estimated overall sonobuoy coverage of 330 m^2 (3,552 ft^2). The USWTR seafloor would encompass an area of 1,471 km^2 (428 NM^2), the total coverage of the USWTR by sonobuoys would be 0.00002% of the USWTR seafloor annually. The sonobuoys, as well as other devices left in place in the USWTR, would degrade and corrode over time. However, if the sonobuoys fell on top of *Lophelia* reefs, or other fragile live bottom habitats, the impact on the live/hardbottom communities as a result of this action could be more adverse. As a result, the use of sensing devices such as sonobuoys and XBTs on the USWTR Site B may adversely affect the live/hard bottom EFH.

The chemical components of concern contained in the three different types of batteries used to power sonobuoys are lead, silver, and copper. A study conduced by the DoN investigated the effect of the release of these chemicals under various scenarios on the marine environment and concluded that the chemicals would quickly be dispersed within the water column and would not significantly impact the water quality or the benthic environment (DoN 1993).

The two different target simulators (MK 30 ASW and MK 39) that would be used in the range are very different in size and recoverability. The MK 30 ASW target simulator (planned for recovery, 60 deployed per year) is a torpedo-sized electrically propelled target that weighs 1,224 kg (2,700 lb) and has a length of 6.2 m (20 ft). Although it is a recoverable unit it still has the potential to malfunction and scuttle thus potentially impacting live/hard bottom EFH in the range. While likelihood of this happening is minimal, should it occur, impacts on live/hard bottom EFH may result.

The MK 39 target simulator (50 deployed per year) is not as large as the MK 30 and weighs 9.6 kg (21 lb) and is 12.4 by 91.4 cm (4.9 by 36 in) in length. The MK 39 is pre-programmed to run for several hours after which time it scuttles. Since the MK 39 would not be recovered, potential impacts arise from the 30.5 m (100 ft) of wire, lithium batteries, and a parachute that are associated with the simulator and would sink. Impacts from the associated MK 39 debris may impact live/hard bottom EFH by physically hitting and damaging coral or live/hard bottom communities when sunk, covering (smothering) the habitat, or degrading the habitat from leakage of the batteries. Once scuttled, the MK 39 falls to the ocean bottom where it may land on to a live bottom community and damage the EFH. Consequently, the use of countermeasures and targets on the USWTR Site B may adversely affect the live/hard bottom EFH.

Overall, the use of sensing devices, countermeasures, and targets on the USWTR Site B may adversely affect the live/hard bottom EFH.

- **Impacts on Artificial Reef EFH**

There are no known artificial reefs (and thus no EFH) in the proposed USWTR Site B range; therefore the use of sensing devices, countermeasures, and targets will not adversely affect artificial reef EFH.

- **Impacts on Pelagic *Sargassum* EFH**

No significant impacts on pelagic *Sargassum* EFH would be expected from the release of sensing devices, countermeasures, and targets at the proposed USWTR Site B. Pelagic *Sargassum* occurs in all three proposed sites and serves as EFH for several fish species, particularly the larval lifestage. The exact location of *Sargassum* at any given time within each site is impossible to predict. Sensing devices (e.g., sonobuoys), counter measures, and targets released into the water from either a ship or an aircraft may briefly encounter pelagic *Sargassum* floating at the surface and temporarily disturb *Sargassum* mats. Given the patchy distribution of *Sargassum* and the transient nature of the impact, the use of sensing devices, countermeasures, and targets at the USWTR Site B will not adversely affect pelagic *Sargassum* EFH.

- **Impacts on Water Column EFH**

Water column EFH consists of 100% of the water column within the proposed USWTR Site B. Chemicals would be introduced into the water column with the release and expenditure of various types of sensing devices, countermeasures, and targets. An estimate 132 XBTs and 3,000 sonobuoys would be released per year in the USWTR and would quickly sink to the seafloor to breakdown over time. XBTs do not use batteries and do not contain any potentially hazardous materials. Sonobuoys can use three different types of batteries, each of which releases one of the following chemicals of concern: lead, silver, or copper.

The concentration of each chemical within the water column over the lifetime of the battery was modeled, and it is estimated that concentrations would be well below federal water quality limits throughout the water column (DoN 1993). Therefore, the release of sonobuoys and XBTs on USWTR Site B will not adversely affect water column EFH.

Countermeasures and targets use lithium sulfur dioxide ($LiSO_2$) batteries. The chemical constituents that result from the breakdown of the batteries are commonly found in seawater and pose no risk to the natural environment. Any elevated concentrations that exist in the immediate vicinity of a battery would only be temporary and would be diluted by the action of currents (DoN 1993). Therefore, the use of countermeasures and targets on USWTR Site B will not adversely affect water column EFH.

- **Impacts on Currents EFH**

Although surface currents and other circulation features occur at varying spatial and temporal scales throughout the region, the most dominant oceanographic feature in the region is the Gulf Stream. The Gulf Stream is a dynamic feature that undergoes constant fluctuations in its physical properties, including its spatial dimensions. The entire range overlaps with the Gulf Stream (Figure 1-7; Table 1-2). Sensing devices, counter measures, and targets expended into the range would only reside within Gulf Stream for a brief period of time after which they would sink to the seafloor. The release of sensing devices, counter measures, and targets at the USWTR should not impact EFH associated with the Gulf Stream since none of the proposed operations should reduce the suitability of the Gulf Stream to function as EFH. Therefore, the use of sensing devices, countermeasures, and targets at the USWTR Site B will not adversely affect currents EFH.

- **Impacts on Nearshore EFH**

  The release of sensing devices, counter measures, and targets at the USWTR Site B will not adversely affect nearshore EFH since the range would be located over 93 km (50 NM) from shore and would not be located near any nearshore habitat.

- **Impacts on HAPC**

  HAPC within the proposed USWTR Site B consist primarily of pelagic *Sargassum* (Figure 1-8) and live/hard bottom communities. The first habitat type is limited to surface waters and the second is benthic HAPC. The potential impacts on each of these habitats have been assessed previously in this section.

  The release of sensing devices, countermeasures, and targets at the proposed USWTR Site B will not adversely affect pelagic *Sargassum* HAPC (see section above). Potential impacts on benthic HAPC are primarily associated with expended sonobuoys, countermeasures, and targets. It is estimated that 3,000 sonobuoys 35 ADCs, and 50 EMATTs would be used annually. Additionally, 132 XBTs would be used and expended in the USWTR per year. The area of benthic substrate designated as HAPC is unknown. Seventy-nine benthic HAPC are located within the proposed USWTR Site B (Figure 1-8; Table 1-2). The probability of expended sonobuoys, countermeasures, and targets settling on HAPC is low. Over time, the sonobuoys, as well as the other devices left in place in the USWTR, are expected to degrade, corrode, and become incorporated into the sediments.

  Chemical contamination of benthic HAPC from expended batteries used in sonobuoys, countermeasures, and targets poses a potential impact on benthic HAPC. The concentrations of lead, silver, and copper (the three chemicals of concern) should be well below federal water quality limits throughout the entire water column, and it is reasonable to extend this expectation to chemicals released at the interface of the water column and benthic HAPC. The chemicals released from the degradation of $LiSO_2$ batteries are commonly found in sea water, and should pose no risk to the natural environment (DoN 1993). Overall, however, due to the number of devices deployed and to the sensitive nature of the habitat, the use of sensing devices, countermeasures, and targets at the USWTR Site B may adversely affect benthic HAPC.

2.4.3 Site C—Cherry Point

- **Impacts on Benthic Substrate EFH (not including live/hard bottom)**

  Various countermeasures would be deployed such as acoustic device countermeasures that weigh between 3 and 57 kg (7 and 125 lb), with a diameter of 8 to 15 cm (3 to 6 in) and a length of 102 to 280 cm (40 to 110 in).

  Throughout the year 3,000 sonobuoys including XBTs would be deployed within the range that weigh 6 to 18 kg (14 to 39 lb) and are 12.5 cm (4.9 in) in diameter and 91 cm (36 in) in length. Sonobuoys contain lead chloride batteries, parachutes for deployment, exterior cases, and sea anchors. The maximum seafloor area covered by sonobuoys settling on the bottom was estimated by multiplying the typical length of a sonobuoy (91 cm [36 in]) by the diameter (12.5 cm [4.9 in]) to obtain a footprint of 1,135 cm^2 (176 in^2), or 0.11 m^2 (1.2 ft^2). This number, multiplied by 3,000 (the estimated number of sonobuoys used per year) provides an estimated overall sonobuoy coverage of 330 m^2 (3,552 ft^2). The USWTR seafloor would encompass an area of 1,639 km^2 (478 NM^2), the total coverage of the USWTR by sonobuoys would be 0.00002% of the USWTR seafloor annually. The sonobuoys, as well as other devices left in place in the USWTR, would degrade, corrode, and become incorporated into the sediments but initially would lie on the sediment and change soft bottom to hard bottom. This initial settling before erosion could have temporary and no more than minimal impacts on benthic EFH substrate as a result of this action.

The chemical components of concern contained in the three different types of batteries used to power sonobuoys are lead, silver, and copper. A study conduced by the DoN investigated the effect of the release of these chemicals under various scenarios on the marine environment and concluded that the chemicals would quickly be dispersed within the water column and would not significantly impact the water quality for the benthic environment (DoN 1993). Between the chemical components and physical structure of the sensing devices, the use of sonobuoys and XBTs at USWTR Site C will not adversely affect benthic substrate (not including live/hard bottom) EFH.

The two different target simulators (MK 30 ASW and MK 39) that would be used in the range are very different in size and recoverability thus their impacts on the benthic substrates EFH would be different. The MK 30 ASW target simulator (planned for recovery, 60 deployed per year) is a torpedo-sized electrically propelled target that weighs 1,224 kg (2,700 lb) and has a length of 6.2 m (20 ft). Although it is a recoverable unit it still has the potential to malfunction and scuttle thus impacting benthic substrate EFH in the range. While the likelihood of this happening would be minimal, should it occur, impacts on benthic substrate EFH as a result of this action would be temporary.

The MK 39 target simulator (50 deployed per year) is not as large as the MK 30 and weighs 9.6 kg (21 lb) and is 12.4 by 91.4 cm (4.9 by 36 in) in length. The potential impacts from the MK 39 is the fact that it is not recoverable and contains 30.5 m (100 ft) of wire, lithium batteries, and a parachute that sinks. It is preprogrammed to run for several hours after which time it scuttles. Once it scuttles and falls upon benthic substrate EFH in the range, the heavier components potentially can impact this area by disturbing the fine sediments thus causing a siltation effect potentially impacting benthic species in the vicinity. The lighter components such as the parachute could temporarily smother benthic species in the vicinity causing temporary impacts until the parachute eroded but no significant impacts would result from this action. Therefore, the use of countermeasures and targets on USWTR Site C will not adversely affect benthic substrate (not including live/hard bottom) EFH.

Overall, the use of sensing devices, countermeasures, and targets on the USWTR Site C will not adversely affect benthic substrate (not including live/hard bottom) EFH.

- **Impacts on Live/Hard Bottom EFH**

Various countermeasures would be deployed such as acoustic device countermeasures that weigh between 3 and 57 kg (7 and 125 lb), with a diameter of 8 to 15 cm (3 to 6 in) and a length of 102 to 280 cm (40 to 110 in).

Throughout the year 3,000 sonobuoys including XBTs would be deployed within the range that weigh 6 to 18 kg (14 to 39 lb) and are 12.5 cm (4.9 in) in diameter and 91 cm (36 in) in length. Sonobuoys contain lead chloride batteries, parachutes for deployment, exterior cases, and sea anchors. The maximum seafloor area covered by sonobuoys settling on the bottom was estimated by multiplying the typical length of a sonobuoy (91 cm [36 in]) by the diameter (12.5 cm [4.9 in]) to obtain a footprint of 1,135 cm^2 (176 in^2), or 0.11 m^2 (1.2 ft^2). This number, multiplied by 3,000 (the estimated number of sonobuoys used per year) provides an estimated overall sonobuoy coverage of 330 m^2 (3,552 ft^2). The USWTR seafloor would encompass an area of 1,639 km^2 (478 NM^2), the total coverage of the USWTR by sonobuoys would be 0.00002% of the USWTR seafloor annually. The sonobuoys, as well as other devices left in place in the USWTR, would degrade and corrode over time. However, if the sonobuoys fell on top of *Lophelia* reefs, or other fragile live bottom habitats, the impact on the live/hardbottom communities as a result of this action could be more adverse. As a result, the use of sensing devices such as sonobuoys and XBTs on the USWTR Site C may adversely affect the live/hard bottom EFH.

The chemical components of concern contained in the three different types of batteries used to power sonobuoys are lead, silver, and copper. A study conduced by the DoN investigated the effect of the release of these chemicals under various scenarios on the marine environment and concluded that the chemicals would quickly be dispersed within the water column and would not significantly impact the water quality for the benthic environment (DoN 1993).

The two different target simulators (MK 30 ASW and MK 39) that would be used in the range are very different in size and recoverability. The MK 30 ASW target simulator (planned for recovery, 60 deployed per year) is a torpedo-sized electrically propelled target that weighs 1,224 kg (2,700 lb) and has a length of 6.2 m (20 ft). Although it is a recoverable unit it still has the potential to malfunction and scuttle, thus potentially impacting live/hard bottom EFH in the range. While likelihood of this happening is minimal, should it occur, impacts on live/hard bottom EFH may result.

The MK 39 target simulator (50 deployed per year) is not as large as the MK 30 and weighs 9.6 kg (21 lb) and is 12.4 by 91.4 cm (4.9 by 36 in) in length. The MK 39 is pre-programmed to run for several hours after which time it scuttles. Since the MK 39 would not be recovered, potential impacts arise from the 30.5 m (100 ft) of wire, lithium batteries, and a parachute that are associated with the simulator and would sink. Impacts from the associated MK 39 debris may impact live/hard bottom EFH by physically hitting and damaging coral or live/hard bottom communities when sunk, covering (smothering) the habitat, or degrading the habitat from leakage of the batteries. Once scuttled, the MK 39 falls to the ocean bottom where it may land on to a live bottom community and damage the EFH. Consequently, the use of countermeasures and targets on the USWTR Site C may adversely affect the live/hard bottom EFH.

Overall, the use of sensing devices, countermeasures, and targets on the USWTR Site C may adversely affect the live/hard bottom EFH.

- **Impacts on Artificial Reef EFH**

  There are no known artificial reefs (and thus no EFH) in the proposed USWTR Site C range; therefore the use of sensing devices, countermeasures, and targets will not adversely affect artificial reef EFH.

- **Impacts on Pelagic *Sargassum* EFH**

  No significant impacts on pelagic *Sargassum* EFH would be expected from the release of sensing devices, countermeasures, and targets at the proposed USWTR Site C. Pelagic *Sargassum* occurs in all four proposed sites and serves as EFH for several fish species, particularly the larval lifestage. The exact location of *Sargassum* at any given time within each site is impossible to predict. Sensing devices (e.g., sonobuoys), counter measures, and targets released into the water from either a ship or an aircraft may briefly encounter pelagic *Sargassum* floating at the surface and temporarily disturb *Sargassum* mats. Given the patchy distribution of *Sargassum* and the transient nature of the impact, the use of sensing devices, countermeasures, and targets at the USWTR Site C will not adversely affect pelagic *Sargassum* EFH.

- **Impacts on Water Column EFH**

  Water column EFH consists of 100% of the water column within the proposed USWTR Site C. Chemicals would be introduced into the water column with the release and expenditure of various types of sensing devices, countermeasures, and targets. An estimate 132 XBTs and 3,000 sonobuoys would be released per year in the USWTR and would quickly sink to the seafloor to break down over time. XBTs do not use batteries and do not contain any potentially hazardous materials. Sonobuoys can use three different types of batteries, each of which releases one of the following chemicals of concern: lead, silver, or copper.

  The concentration of each chemical within the water column over the lifetime of the battery was modeled, and it is estimated that concentrations would be well below federal water quality limits throughout the water column (DoN 1993). Therefore, the release of sonobuoys and XBTs on USWTR Site C will not adversely affect water column EFH.

Countermeasures and targets use lithium sulfur dioxide ($LiSO_2$) batteries. The chemical constituents that result from the breakdown of the batteries are commonly found in seawater and pose no risk to the natural environment. Any elevated concentrations that exist in the immediate vicinity of a battery would only be temporary and would be diluted by the action of currents (DoN 1993). Therefore, the use of countermeasures and targets on USWTR Site C will not adversely affect water column EFH.

- **Impacts on Currents EFH**

Although surface currents and other circulation features occur at varying spatial and temporal scales throughout the region, the most dominant oceanographic feature in the region is the Gulf Stream. The Gulf Stream is a dynamic feature that undergoes constant fluctuations in its physical properties, including its spatial dimensions. The entire range overlaps with the Gulf Stream (Figure 1-11; Table 1-2). Sensing devices, counter measures, and targets expended into the range would only reside within Gulf Stream for a brief period of time after which they would sink to the seafloor. The release of sensing devices, counter measures, and targets at the USWTR should not impact EFH associated with the Gulf Stream since none of the proposed operations should reduce the suitability of the Gulf Stream to function as EFH. Therefore, the use of sensing devices, countermeasures, and targets at the USWTR Site C will not adversely affect currents EFH.

- **Impacts on Nearshore EFH**

The release of sensing devices, counter measures, and targets at the USWTR Site C will not adversely affect nearshore EFH since the range would be located over 93 km (50 NM) from shore and would not be located near any nearshore habitat.

- **Impacts on HAPC**

HAPC within the proposed USWTR Site C consist primarily of pelagic *Sargassum* (Figure 1-12) and live/hard bottom communities. The first habitat type is limited to surface waters and the second is benthic HAPC. The potential impacts on each of these habitats have been assessed previously in this section.

The release of sensing devices, countermeasures, and targets at the proposed USWTR Site C will not cause significant harm to pelagic *Sargassum* HAPC (see section above). Potential impacts on benthic HAPC are primarily associated with expended sonobuoys, countermeasures, and targets. It is estimated that 3,000 sonobuoys 35 ADCs, and 50 EMATTs would be used annually. Additionally, 132 XBTs would be used and expended in the USWTR per year. The area of benthic substrate designated as HAPC is unknown; however, only a small amount of HAPC within the proposed USWTR Site C and adjacent trunk cable corridor has been designated (Figure 1-22; Table 1-2). The probability of expended sonobuoys, countermeasures, and targets settling on HAPC is low. Over time, the sonobuoys, as well as the other devices left in place in the USWTR, are expected to degrade, corrode, and become incorporated into the sediments.

Chemical contamination of benthic HAPC from expended batteries used in sonobuoys, countermeasures, and targets poses a potential impact on benthic HAPC. The concentrations of lead, silver, and copper (the three chemicals of concern) should be well below federal water quality limits throughout the entire water column, and it is reasonable to extend this expectation to chemicals released at the interface of the water column and benthic HAPC. The chemicals released from the degradation of $LiSO_2$ batteries are commonly found in sea water, and should pose no risk to the natural environment (DoN 1993). Overall, however, due to the number of devices deployed and to the sensitive nature of the habitat, the use of sensing devices, countermeasures, and targets at the USWTR Site C may adversely affect benthic HAPC.

2.4.4 Site D—VACAPES

- **Impacts on Benthic Substrate EFH (not including live/hard bottom)**

  Various countermeasures would be deployed such as acoustic device countermeasures that weigh between 3 and 57 kg (7 and 125 lb), with a diameter of 8 to 15 cm (3 to 6 in) and a length of 102 to 280 cm (40 to 110 in).

  Throughout the year 3,000 sonobuoys including XBTs would be deployed within the range that weigh 6 to 18 kg (14 to 39 lb) and are 12.5 cm (4.9 in) in diameter and 91 cm (36 in) in length. Sonobuoys contain lead chloride batteries, parachutes for deployment, exterior cases, and sea anchors. The maximum seafloor area covered by sonobuoys settling on the bottom was estimated by multiplying the typical length of a sonobuoy (91 cm [36 in]) by the diameter (12.5 cm [4.9 in]) to obtain a footprint of 1,135 cm^2 (176 in^2), or 0.11 m^2 (1.2 ft^2). This number, multiplied by 3,000 (the estimated number of sonobuoys used per year) provides an estimated overall sonobuoy coverage of 330 m^2 (3,552 ft^2). The USWTR seafloor would encompass an area of 1,591 km^2 (464 NM^2), the total coverage of the USWTR by sonobuoys would be 0.00002% of the USWTR seafloor annually. The sonobuoys, as well as other devices left in place in the USWTR, would degrade, corrode, and become incorporated into the sediments but initially would lie on the sediment and change soft bottom to hard bottom. This initial settling before erosion could have temporary and no more than minimal impacts on benthic EFH substrate as a result of this action.

  The chemical components of concern contained in the three different types of batteries used to power sonobuoys are lead, silver, and copper. A study conduced by the DoN investigated the effect of the release of these chemicals under various scenarios on the marine environment and concluded that the chemicals would quickly be dispersed within the water column and would not significantly impact the water quality for the benthic environment (DoN 1993). Between the chemical components and physical structure of the sensing devices, the use of sonobuoys and XBTs at USWTR Site D will not adversely affect benthic substrate (not including live/hard bottom) EFH.

  The two different target simulators (MK 30 ASW and MK 39) that would be used in the range are very different in size and recoverability thus their impacts on the benthic substrates EFH would be different. The MK 30 ASW target simulator (planned for recovery, 60 deployed per year) is a torpedo-sized electrically propelled target that weighs 1,224 kg (2,700 lb) and has a length of 6.2 m (20 ft). Although it is a recoverable unit it still has the potential to malfunction and scuttle thus impacting benthic substrate EFH in the range. While the likelihood of this happening would be minimal, should it occur, impacts on benthic substrate EFH as a result of this action would be temporary.

  The MK 39 target simulator (50 deployed per year) is not as large as the MK 30 and weighs 9.6 kg (21 lb) and is 12.4 by 91.4 cm (4.9 by 36 in) in length. The potential impacts from the MK 39 is the fact that it is not recoverable and contains 30.5 m (100 ft) of wire, lithium batteries, and a parachute that sinks. It is preprogrammed to run for several hours after which time it scuttles. Once it scuttles and falls upon benthic substrate EFH in the range, the heavier components potentially can impact this area by disturbing the fine sediments thus causing a siltation effect potentially impacting benthic species in the vicinity. The lighter components such as the parachute could temporarily smother benthic species in the vicinity causing temporary but not significant impacts as a result of this action. Therefore, the use of countermeasures and targets on USWTR Site D will not adversely affect benthic substrate (not including live/hard bottom) EFH.

  Overall, the use of sensing devices, countermeasures, and targets on the USWTR Site D will not adversely affect benthic substrate (not including live/hard bottom) EFH.

- **Impacts on Live/Hard Bottom EFH**

Various countermeasures would be deployed such as acoustic device countermeasures that weigh between 3 and 57 kg (7 and 125 lb), with a diameter of 8 to 15 cm (3 to 6 in) and a length of 102 to 280 cm (40 to 110 in). Throughout the year 3,000 sonobuoys including XBTs would be deployed within the range that weigh 6 to 18 kg (14 to 39 lb) and are 12.5 cm (4.9 in) in diameter and 91 cm (36 in) in length. Sonobuoys contain lead chloride batteries, parachutes for deployment, exterior cases, and sea anchors. The maximum seafloor area covered by sonobuoys settling on the bottom was estimated by multiplying the typical length of a sonobuoy (91 cm [36 in]) by the diameter (12.5 cm [4.9 in]) to obtain a footprint of 1,135 cm^2 (176 in^2), or 0.11 m^2 (1.2 ft^2). This number, multiplied by 3,000 (the estimated number of sonobuoys used per year) provides an estimated overall sonobuoy coverage of 330 m^2 (3,552 ft^2). The USWTR seafloor would encompass an area of 1,591 km^2 (464 NM^2), the total coverage of the USWTR by sonobuoys would be 0.00002% of the USWTR seafloor annually. The sonobuoys, as well as other devices left in place in the USWTR, would degrade and corrode over time. Due to the lack of hardbottom areas and the relative scarcity of shipwrecks in the USWTR Site D, the use of sensing devices such as sonobuoys and XBTs will not adversely affect live/hard bottom EFH.

The chemical components of concern contained in the three different types of batteries used to power sonobuoys are lead, silver, and copper. A study conduced by the DoN investigated the effect of the release of these chemicals under various scenarios on the marine environment and concluded that the chemicals would quickly be dispersed within the water column and would not significantly impact the water quality for the benthic environment (DoN 1993).

The two different target simulators (MK 30 ASW and MK 39) that would be used in the range are very different in size and recoverability. The MK 30 ASW target simulator (planned for recovery, 60 deployed per year) is a torpedo-sized electrically propelled target that weighs 1,224 kg (2,700 lb) and has a length of 6.2 m (20 ft). Although it is a recoverable unit it still has the potential to malfunction and scuttle thus potentially impacting live/hard bottom EFH (shipwrecks) in the range. Given that only one shipwreck is known to exist within the range, the likelihood of this occurring is remote.

The MK 39 target simulator (50 deployed per year) is not as large as the MK 30 and weighs 9.6 kg (21 lb) and is 12.4 by 91.4 cm (4.9 by 36 in) in length. The MK 39 is pre-programmed to run for several hours after which time it scuttles. Since the MK 39 would not be recovered, potential impacts arise from the 30.5 m (100 ft) of wire, lithium batteries, and a parachute that are associated with the simulator and would sink. Impacts from the associated MK 39 debris may impact live/hard bottom EFH by physically hitting live/hard bottom or the shipwreck when sunk or degrading the habitat from leakage of the batteries. However, due to the lack of hardbottom areas and the relative scarcity of shipwrecks in the USWTR Site D, the use of countermeasures and targets will have a low probability of impacting live/hard bottom EFH. Therefore, no adverse affects on live/hard bottom EFH will occur.

Overall, the use of sensing devices, countermeasures, and targets on the USWTR Site D will not adversely affect live/hard bottom EFH.

- **Impacts on Artificial Reef EFH**

There are no known artificial reefs (and thus no EFH) in the proposed USWTR Site D range; therefore the use of sensing devices, countermeasures, and targets will not adversely affect artificial reef EFH.

- **Impacts on Pelagic *Sargassum* EFH**

Pelagic *Sargassum* occurs in all four proposed sites and serves as EFH for several fish species, particularly the larval lifestage. The exact location of *Sargassum* at any given time within each site is impossible to predict. Sensing devices (e.g., sonobuoys), counter measures, and targets released into the water from either a ship or an aircraft may briefly encounter pelagic *Sargassum* floating at the surface and temporarily disturb *Sargassum* mats. Given the patchy distribution of *Sargassum* and the transient nature of the impact, the use of sensing devices, countermeasures, and targets at the USWTR Site D will not adversely affect pelagic *Sargassum* EFH.

- **Impact on Water Column EFH**

  Water column EFH consists of 100% of the water column within the proposed Site D USWTR. Chemicals would be introduced into the water column with the release and expenditure of various types of sensing devices, countermeasures, and targets. An estimate 132 XBTs and 3,000 sonobuoys would be released per year in the USWTR and would quickly sink to the seafloor to break down over time. XBTs do not use batteries and do not contain any potentially hazardous materials. Sonobuoys can use three different types of batteries, each of which releases one of the following chemicals of concern: lead, silver, or copper.

  The concentration of each chemical within the water column over the lifetime of the battery was modeled, and it is estimated that concentrations would be well below federal water quality limits throughout the water column (DoN 1993). Therefore, the release of sonobuoys and XBTs on USWTR Site D will not adversely affect water column EFH.

  Countermeasures and targets use lithium sulfur dioxide ($LiSO_2$) batteries. The chemical constituents that result from the breakdown of the batteries are commonly found in seawater and pose no risk to the natural environment. Any elevated concentrations that exist in the immediate vicinity of a battery would only be temporary and would be diluted by the action of currents (DoN 1993). Therefore, the use of countermeasures and targets on USWTR Site D will not adversely affect water column EFH.

- **Impact on Currents EFH**

  No currents EFH is designated in the vicinity of the proposed USWTR Site D.

- **Impact on Nearshore EFH**

  The release of sensing devices, counter measures, and targets at the USWTR Site C will not adversely affect nearshore EFH since the range would be located over 93 km (50 NM) from shore and would not be located near any nearshore habitat.

- **Impact on HAPC**

  No HAPC are designated in the vicinity of the proposed USWTR Site D.

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APPENDIX A: EFH TABLES

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Table A-1
EFH Habitats by Species and Lifestages for Site A Range.

Species Lifestage	Benthic Substrate (not including hard bottom substrate)	Live/Hard Bottom	Artificial Reef	Pelagic *Sargassum*	Currents	Water Column	HAPC
Bluefish							
egg						X	
larva					X	X	
juvenile					X	X	
adult						X	
Spiny dogfish							
juvenile						X	
adult						X	
Summer flounder							
egg						X	
larva						X	
juvenile						X	
adult						X	
Tilefish							
larva				X	X	X	X
adult/spawning adult							X
Atlantic calico scallop							
larva					X		
all lifestages	X						

Table A-1 (*continued*)
EFH Habitats by Species and Lifestages for Site A Range.

Species Lifestage	Benthic Substrate (not including hard bottom substrate)	Live/Hard Bottom	Artificial Reef	Pelagic *Sargassum*	Currents	Water Column	HAPC
Blackfin snapper							
larva				X	X		X
juvenile		X					X
adult/spawning adult		X				X	X
Blueline tilefish							
egg						X	X
larva					X	X	X
adult/spawning adult	X					X	X
							X
Brown rock shrimp							
larva					X		
adult	X						
Brown shrimp							
egg	X	X					
larva						X	
adult	X						
Caribbean spiny lobster							
larva					X		
all lifestages	X	X				X	

Table A-1 (*continued*)
EFH Habitats by Species and Lifestages for Site A Range.

Species Lifestage	Benthic Substrate (not including hard bottom substrate)	Live/Hard Bottom	Artificial Reef	Pelagic *Sargassum*	Currents	Water Column	HAPC
Cobia							
larva					X		X
all lifestages	X			X			X
Corals							
all lifestages		X					X
Dolphinfish							
all lifestages					X		X
Pompano dolphinfish							
all lifestages					X		X
Golden deepsea crab							
larva					X		
all lifestages	X						
Goliath grouper							
larva				X	X		X
juvenile		X					X
adult/spawning adult		X				X	X

Table A-1 (*continued*)
EFH Habitats by Species and Lifestages for Site A Range.

Species Lifestage	Benthic Substrate (not including hard bottom substrate)	Live/Hard Bottom	Artificial Reef	Pelagic *Sargassum*	Currents	Water Column	HAPC
Gray snapper							
egg						X	X
larva				X	X	X	X
juvenile							X
adult/spawning adult		X				X	X
Greater amberjack							
larva				X	X		X
juvenile				X			X
adult/spawning adult							X
King mackerel							
larva					X		X
all lifestages	X			X			X
Mutton snapper							
egg						X	X
larva				X	X	X	X
juvenile							X
adult/spawning adult	X	X				X	X
Pink shrimp							
adult	X						
Red drum							
adult	X						

Table A-1 (*continued*)
EFH Habitats by Species and Lifestages for Site A Range.

Species Lifestage	Benthic Substrate (not including hard bottom substrate)	Live/Hard Bottom	Artificial Reef	Pelagic *Sargassum*	Currents	Water Column	HAPC
Red porgy							
egg						X	X
larva				X	X	X	X
adult/spawning adult	X	X				X	X
Red snapper							
egg						X	X
larva				X	X	X	X
adult/spawning adult	X	X				X	X
Royal red shrimp							
larva					X		
adult	X						
Scamp							
larva				X	X	X	X
adult/spawning adult		X				X	X
Silk snapper							
larva				X	X		X
juvenile		X					X
adult/spawning adult		X				X	X

Table A-1 (*continued*)
EFH Habitats by Species and Lifestages for Site A Range.

Species Lifestage	Benthic Substrate (not including hard bottom substrate)	Live/Hard Bottom	Artificial Reef	Pelagic *Sargassum*	Currents	Water Column	HAPC
Snowy grouper							
egg						X	X
larva				X	X		X
adult/spawning adult	X	X					X
Spanish mackerel							
larva						X	X
all lifestages	X			X			X
Speckled hind							
larva				X	X	X	X
adult/spawning adult	X	X				X	X
Vermilion snapper							
egg						X	X
larva				X	X	X	X
juvenile		X					X
adult/spawning adult		X				X	X
Wahoo							
all lifestages					X		X
Warsaw grouper							
egg						X	X
larva				X	X	X	X
adult/spawning adult		X				X	X

Table A-1 (*continued*)
EFH Habitats by Species and Lifestages for Site A Range.

Species Lifestage	Benthic Substrate (not including hard bottom substrate)	Live/Hard Bottom	Artificial Reef	Pelagic *Sargassum*	Currents	Water Column	HAPC
White grunt							
egg						X	X
larva				X	X	X	X
juvenile		X					X
adult/spawning adult		X				X	X
Wreckfish							
larva				X	X		X
juvenile						X	X
adult/spawning adult							X
Yellowedge grouper							
egg						X	X
larva				X	X	X	X
adult/spawning adult	X	X				X	X
Atlantic sharpnose shark							
adult						X	
Blacktip shark							
adult						X	
Blue marlin							
juvenile & subadult						X	
adult						X	

Table A-1 (*continued*)
EFH Habitats by Species and Lifestages for Site A Range.

Species Lifestage	Benthic Substrate (not including hard bottom substrate)	Live/Hard Bottom	Artificial Reef	Pelagic *Sargassum*	Currents	Water Column	HAPC
Bluefin tuna							
spawning adult, egg, & larva						X	
Dusky shark							
neonate						X	
juvenile						X	
adult						X	
Longfin mako shark							
neonate & early juvenile	X	X				X	
juvenile & subadult	X	X				X	
adult	X	X				X	
Night shark							
adult	X	X				X	
Oceanic whitetip shark							
late juvenile & subadult						X	
adult						X	

Table A-1 (*continued*)
EFH Habitats by Species and Lifestages for Site A Range.

Species Lifestage	Benthic Substrate (not including hard bottom substrate)	Live/Hard Bottom	Artificial Reef	Pelagic *Sargassum*	Currents	Water Column	HAPC
Sailfish							
juvenile & subadult						X	
adult						X	
Sandbar shark							
adult	X	X				X	
Scalloped hammerhead shark							
late juvenile & subadult						X	
adult						X	
Silky shark							
late juvenile & subadult						X	
Spinner shark							
late juvenile & subadult						X	
Swordfish							
spawning adult, egg, & larva					X	X	
adult						X	

Table A-1 (*continued*)
EFH Habitats by Species and Lifestages for Site A Range.

Species Lifestage	**Benthic Substrate (not including hard bottom substrate)**	**Live/Hard Bottom**	**Artificial Reef**	**Pelagic *Sargassum***	**Currents**	**Water Column**	**HAPC**
Tiger shark							
neonate & early juvenile	X	X				X	
late juvenile & subadult	X	X				X	
adult					X	X	
White marlin							
juvenile & subadult						X	

Table A-2
EFH Habitats by Species and Lifestages for Site A Corridor.

Species/ Lifestage	Benthic Substrate (not including hard bottom substrate)	Live/Hard Bottom	Artificial Reef	Pelagic *Sargassum*	Currents	Water Column	Nearshore	HAPC
Bluefish								
Egg						X	X	
larva						X		
juvenile						X	X	
adult							X	
Spiny dogfish								
juvenile						X	X	
adult						X	X	
Summer flounder								
egg						X	X	
larva						X	X	
juvenile	X					X	X	X
adult	X					X	X	X
Tilefish								
larva				X		X	X	X
adult/spawning adult								X
Atlantic calico scallop								
all lifestages	X						X	
Blackfin snapper								
larva				X			X	X
juvenile		X					X	X
adult/spawning adult								X

Table A-2 (*continued*)
EFH Habitats by Species and Lifestages for Site A Corridor.

Species/ Lifestage	Benthic Substrate (not including hard bottom substrate)	Live/Hard Bottom	Artificial Reef	Pelagic *Sargassum*	Currents	Water Column	Nearshore	HAPC
Blueline tilefish								
egg						X	X	X
larva						X	X	X
adult/spawning adult						X		X
Brown rock shrimp								
adult	X							
Brown shrimp								
egg	X	X					X	X
larva						X	X	X
juvenile							X	X
adult	X						X	X
Caribbean spiny lobster								
all lifestages	X	X				X	X	
Cobia								
all lifestages	X			X			X	X
Corals								
all lifestages		X					X	
Dolphinfish								
all lifestages					X			

Table A-2 (*continued*)
EFH Habitats by Species and Lifestages for Site A Corridor.

Species/ Lifestage	Benthic Substrate (not including hard bottom substrate)	Live/Hard Bottom	Artificial Reef	Pelagic *Sargassum*	Currents	Water Column	Nearshore	HAPC
Pompano dolphinfish								
all lifestages					X			
Goliath grouper								
larva				X			X	X
juvenile		X	X				X	X
adult/spawning adult		X	X			X	X	X
Gray snapper								
egg						X	X	X
larva				X		X	X	X
juvenile	X	X	X				X	X
adult/spawning adult		X	X			X	X	X
Greater amberjack								
larva				X				X
juvenile				X				X
adult/spawning adult			X			X		X
King mackerel								
all lifestages	X			X			X	X
Mutton snapper								
egg						X	X	X
larva				X		X	X	X
juvenile	X						X	X
adult/spawning adult	X	X				X	X	X

Table A-2 (*continued*)
EFH Habitats by Species and Lifestages for Site A Corridor.

Species/ Lifestage	Benthic Substrate (not including hard bottom substrate)	Live/Hard Bottom	Artificial Reef	Pelagic *Sargassum*	Currents	Water Column	Nearshore	HAPC
Pink shrimp								
egg	X	X					X	X
larva						X	X	X
juvenile							X	X
adult	X							X
Red drum								
adult			X				X	X
all other lifestages							X	X
Red porgy								
egg						X	X	X
larva				X		X	X	X
adult/spawning adult	X	X				X		X
Red snapper								
egg						X	X	X
larva				X		X	X	X
adult/spawning adult	X	X				X	X	X
Scamp								
larva				X		X	X	X
adult/spawning adult		X				X		X
Silk snapper								
larva				X			X	X
juvenile		X	X				X	X
adult/spawning adult								X

Table A-2 (*continued*)
EFH Habitats by Species and Lifestages for Site A Corridor.

Species/ Lifestage	Benthic Substrate (not including hard bottom substrate)	Live/Hard Bottom	Artificial Reef	Pelagic *Sargassum*	Currents	Water Column	Nearshore	HAPC
Snowy grouper								
egg						X	X	X
larva				X			X	X
adult/spawning adult	X	X					X	X
Spanish mackerel								
all lifestages	X			X			X	X
Speckled hind								
larva				X		X	X	X
adult/spawning adult	X	X				X		X
Vermilion snapper								
egg						X	X	X
larva				X		X	X	X
juvenile		X						X
adult/spawning adult		X				X		X
Wahoo								
all lifestages					X			
Warsaw grouper								
egg						X	X	X
larva				X		X	X	X
adult/spawning adult						X		X

Table A-2 (*continued*)
EFH Habitats by Species and Lifestages for Site A Corridor.

Species/ Lifestage	Benthic Substrate (not including hard bottom substrate)	Live/Hard Bottom	Artificial Reef	Pelagic *Sargassum*	Currents	Water Column	Nearshore	HAPC
White grunt								
egg						X	X	X
larva				X		X	X	X
juvenile		X					X	X
adult/spawning adult		X				X	X	X
White shrimp								
egg	X	X					X	X
larva						X	X	X
juvenile							X	X
adult	X						X	X
Wreckfish								
larva				X			X	X
juvenile						X	X	X
adult/spawning adult								X
Yellowedge grouper								
egg						X	X	X
larva				X	X	X	X	X
adult/spawning adult								X
Atlantic sharpnose shark								
neonate & early juvenile						X	X	
late juvenile & subadult						X	X	
adult						X		

Table A-2 (*continued*)
EFH Habitats by Species and Lifestages for Site A Corridor.

Species/ Lifestage	Benthic Substrate (not including hard bottom substrate)	Live/Hard Bottom	Artificial Reef	Pelagic *Sargassum*	Currents	Water Column	Nearshore	HAPC
Blacknose shark								
neonate & early juvenile						X	X	
late juvenile & subadult						X	X	
Blacktip shark								
neonate						X	X	
juvenile						X	X	
adult						X	X	
Bluefin tuna								
spawning adult, egg, & larva						X		
Bonnethead shark								
neonate & early juvenile						X	X	
late juvenile & subadult						X	X	
adult						X	X	
Bull shark								
late juvenile & subadult						X	X	
Dusky shark								
neonate						X	X	
juvenile						X	X	
adult						X		

Table A-2 (*continued*)
EFH Habitats by Species and Lifestages for Site A Corridor.

Species/ Lifestage	Benthic Substrate (not including hard bottom substrate)	Live/Hard Bottom	Artificial Reef	Pelagic *Sargassum*	Currents	Water Column	Nearshore	HAPC
Finetooth shark								
neonate						X	X	
juvenile						X	X	
adult						X	X	
Lemon shark								
neonate & early juvenile						X	X	
late juvenile & subadult						X	X	
adult						X	X	
Nurse shark								
juvenile						X	X	
adult						X	X	
Sailfish								
juvenile & subadult						X	X	
adult						X	X	
Sand tiger shark								
neonate & early juvenile						X	X	
Sandbar shark								
neonate	X	X				X	X	
juvenile	X	X				X	X	
adult	X	X				X	X	

Table A-2 (*continued*)
EFH Habitats by Species and Lifestages for Site A Corridor.

Species/ Lifestage	Benthic Substrates (not including hard bottom substrate)	Live/Hard Bottom	Artificial Reef	Pelagic *Sargassum*	Currents	Water Column	Nearshore	HAPC
Scalloped hammerhead shark								
neonate & early juvenile							X	
late juvenile & subadult						X	X	
Spinner shark								
neonate & early juvenile						X	X	
late juvenile & subadult						X	X	
Tiger shark								
neonate & early juvenile	X	X				X	X	
late juvenile & subadult	X	X				X	X	
adult					X	X		

Table A-3
EFH Habitats by Species and Lifestages for Site B Range.

Species Lifestage	Benthic Substrate (not including hard bottom substrate)	Live/Hard Bottom	Artificial Reef	Pelagic *Sargassum*	Currents	Water Column	HAPC
Bluefish							
egg						X	
larva					X	X	
juvenile					X	X	
adult						X	
Spiny dogfish							
juvenile						X	
adult						X	
Summer flounder							
egg						X	
larva						X	
juvenile						X	
adult						X	
Tilefish							
larva				X	X	X	X
adult/spawning adult							X
Atlantic calico scallop							
larva					X		
all lifestages	X						

Table A-3 (*continued*)
EFH Habitats by Species and Lifestages for Site B Range.

Species Lifestage	Benthic Substrate (not including hard bottom substrate)	Live/Hard Bottom	Artificial Reef	Pelagic *Sargassum*	Currents	Water Column	HAPC
Blackfin snapper							
larva				X	X		X
juvenile		X					X
adult/spawning adult		X				X	X
Blueline tilefish							
egg						X	X
larva					X	X	X
adult/spawning adult	X					X	X
Brown rock shrimp							
larva					X		
adult	X						
Brown shrimp							
egg	X	X					
larva						X	
adult	X						
Caribbean spiny lobster							
larva					X		
all lifestages	X	X				X	

Table A-3 (*continued*)
EFH Habitats by Species and Lifestages for Site B Range.

Species Lifestage	Benthic Substrate (not including hard bottom substrate)	Live/Hard Bottom	Artificial Reef	Pelagic *Sargassum*	Currents	Water Column	HAPC
Cobia							
larva					X		X
all lifestages	X			X			X
Corals							
all lifestages		X					X
Dolphinfish							
all lifestages					X		X
Pompano dolphinfish							
all lifestages					X		X
Golden deepsea crab							
larva					X		
all lifestages	X						
Goliath grouper							
larva				X	X		X
juvenile		X					X
adult/spawning adult		X				X	X

Table A-3 (*continued*)
EFH Habitats by Species and Lifestages for Site B Range.

Species Lifestage	Benthic Substrate (not including hard bottom substrate)	Live/Hard Bottom	Artificial Reef	Pelagic *Sargassum*	Currents	Water Column	HAPC
Gray snapper							
egg						X	X
larva				X	X	X	X
juvenile							X
adult/spawning adult		X				X	X
Greater amberjack							
larva				X	X		X
juvenile				X			X
adult/spawning adult							X
King mackerel							
larva					X		X
all lifestages	X			X			X
Mutton snapper							
egg						X	X
larva				X	X	X	X
juvenile							X
adult/spawning adult	X	X				X	X
Pink shrimp							
adult	X						
Red drum							
adult	X						

Table A-3 (*continued*)
EFH Habitats by Species and Lifestages for Site B Range.

Species Lifestage	Benthic Substrate (not including hard bottom substrate)	Live/Hard Bottom	Artificial Reef	Pelagic *Sargassum*	Currents	Water Column	HAPC
Red porgy							
egg						X	X
larva				X	X	X	X
adult/spawning adult	X	X				X	X
Red snapper							
egg						X	X
larva				X	X	X	X
adult/spawning adult	X	X				X	X
Royal red shrimp							
larva					X		
adult	X						
Scamp							
larva				X	X	X	X
adult/spawning adult		X				X	X
Silk snapper							
larva				X	X		X
juvenile		X					X
adult/spawning adult		X				X	X

Table A-3 (*continued*)
EFH Habitats by Species and Lifestages for Site B Range.

Species Lifestage	Benthic Substrate (not including hard bottom substrate)	Live/Hard Bottom	Artificial Reef	Pelagic *Sargassum*	Currents	Water Column	HAPC
Snowy grouper							
egg						X	X
larva				X	X		X
adult/spawning adult	X	X					X
Spanish mackerel							
larva						X	X
all lifestages	X			X			X
Speckled hind							
larva				X	X	X	X
adult/spawning adult	X	X				X	X
Vermilion snapper							
egg						X	X
larva				X	X	X	X
juvenile		X					X
adult/spawning adult		X				X	X
Wahoo							
all lifestages					X		X
Warsaw grouper							
egg						X	X
larva				X	X	X	X
adult/spawning adult		X				X	X

Table A-3 (*continued*)
EFH Habitats by Species and Lifestages for Site B Range.

Species Lifestage	Benthic Substrate (not including hard bottom substrate)	Live/Hard Bottom	Artificial Reef	Pelagic *Sargassum*	Currents	Water Column	HAPC
White grunt							
egg						X	X
larva				X	X	X	X
juvenile		X					X
adult/spawning adult		X				X	X
Wreckfish							
larva				X	X		X
juvenile						X	X
adult/spawning adult							X
Yellowedge grouper							
egg						X	X
larva				X	X	X	X
adult/spawning adult	X	X				X	X
Bignose shark							
neonate & early juvenile	X	X				X	
late-juvenile & adult	X	X				X	
Blue marlin							
juvenile & subadult						X	
adult						X	

Table A-3
EFH Habitats by Species and Lifestages for Site B Range (cont'd).

Species Lifestage	Benthic Substrate (not including hard bottom substrate)	Live/Hard Bottom	Artificial Reef	Pelagic *Sargassum*	Currents	Water Column	HAPC
Bluefin tuna							
spawning adult, egg, & larva						X	
Dusky shark							
juvenile						X	
adult						X	
Longfin mako shark							
neonate & early juvenile	X	X				X	
juvenile & subadult	X	X				X	
adult	X	X				X	
Night shark							
adult	X	X				X	
Oceanic whitetip shark							
neonate & early-juvenile						X	
late juvenile & subadult						X	
adult						X	

Table A-3 (*continued*)
EFH Habitats by Species and Lifestages for Site B Range.

Species Lifestage	Benthic Substrate (not including hard bottom substrate)	Live/Hard Bottom	Artificial Reef	Pelagic *Sargassum*	Currents	Water Column	HAPC
Sailfish							
juvenile & subadult						X	
adult						X	
Sandbar shark							
adult	X	X				X	
Scalloped hammerhead shark							
late juvenile & subadult						X	
adult						X	
Silky shark							
neonate & early-juvenile						X	
late juvenile & subadult						X	
Swordfish							
spawning adult, egg, & larva					X	X	
juvenile & subadult						X	
adult						X	

Table A-3 (*continued*)
EFH Habitats by Species and Lifestages for Site B Range.

Species Lifestage	Benthic Substrate (not including hard bottom substrate)	Live/Hard Bottom	Artificial Reef	Pelagic *Sargassum*	Currents	Water Column	HAPC
Tiger shark							
neonate & early juvenile	X	X				X	
late juvenile & subadult	X	X				X	
adult					X	X	
White marlin							
juvenile & subadult						X	
adult						X	
Yellowfin tuna							
juvenile & subadult						X	
Adult						X	

Table A-4
EFH Habitats by Species and Lifestages for Site B Corridor.

Species/ Lifestage	Benthic Substrate (not including hard bottom substrate)	Live/Hard Bottom	Artificial Reef	Pelagic *Sargassum*	Currents	Water Column	Nearshore	HAPC
Bluefish								
egg						X	X	
larva						X		
juvenile						X	X	
adult							X	
Spiny dogfish								
juvenile						X	X	
adult						X	X	
Summer flounder								
egg						X	X	
larva						X	X	
juvenile	X					X	X	X
adult	X					X	X	X
Tilefish								
larva				X		X	X	X
adult/spawning adult								X
Atlantic calico scallop								
all lifestages	X						X	
Blackfin snapper								
larva				X			X	X
juvenile		X					X	X
adult/spawning adult								X

Table A-4 (*continued*)
EFH Habitats by Species and Lifestages for Site B Corridor.

Species/ Lifestage	Benthic Substrate (not including hard bottom substrate)	Live/Hard Bottom	Artificial Reef	Pelagic *Sargassum*	Currents	Water Column	Nearshore	HAPC
Blueline tilefish								
egg						X	X	X
larva						X	X	X
adult/spawning adult						X		X
Brown rock shrimp								
adult	X							
Brown shrimp								
egg	X	X					X	X
larva						X	X	X
juvenile							X	X
adult	X						X	X
Caribbean spiny lobster								
all lifestages	X	X				X	X	
Cobia								
all lifestages	X			X			X	X
Corals								
all lifestages		X					X	
Dolphinfish								
all lifestages					X			

Table A-4 (*continued*)
EFH Habitats by Species and Lifestages for Site B Corridor.

Species/ Lifestage	Benthic Substrate (not including hard bottom substrate)	Live/Hard Bottom	Artificial Reef	Pelagic *Sargassum*	Currents	Water Column	Nearshore	HAPC
Pompano dolphinfish								
all lifestages					X			
Goliath grouper								
larva				X			X	X
juvenile		X	X				X	X
adult/spawning adult		X	X			X	X	X
Gray snapper								
egg						X	X	X
larva				X		X	X	X
juvenile	X	X	X				X	X
adult/spawning adult		X	X			X	X	X
Greater amberjack								
larva				X				X
juvenile				X				X
adult/spawning adult			X			X		X
King mackerel								
all lifestages	X			X			X	X
Mutton snapper								
egg						X	X	X
larva				X		X	X	X
juvenile	X						X	X
adult/spawning adult	X	X				X	X	X

Table A-4 (*continued*)
EFH Habitats by Species and Lifestages for Site B Corridor.

Species/ Lifestage	Benthic Substrate (not including hard bottom substrate)	Live/Hard Bottom	Artificial Reef	Pelagic *Sargassum*	Currents	Water Column	Nearshore	HAPC
Pink shrimp								
egg	X	X					X	X
larva						X	X	X
juvenile							X	X
adult	X							X
Red drum								
adult			X				X	X
all other lifestages							X	X
Red porgy								
egg						X	X	X
larva				X		X	X	X
adult/spawning adult	X	X				X		X
Red snapper								
egg						X	X	X
larva				X		X	X	X
adult/spawning adult	X	X				X	X	X
Scamp								
larva				X		X	X	X
adult/spawning adult		X				X		X
Silk snapper								
larva				X			X	X
juvenile		X	X				X	X
adult/spawning adult								X

Table A-4 (*continued*)
EFH Habitats by Species and Lifestages for Site B Corridor.

Species/ Lifestage	Benthic Substrate (not including hard bottom substrate)	Live/Hard Bottom	Artificial Reef	Pelagic *Sargassum*	Currents	Water Column	Nearshore	HAPC
Snowy grouper								
egg						X	X	X
larva				X			X	X
adult/spawning adult	X	X					X	X
Spanish mackerel								
all lifestages	X			X			X	X
Speckled hind								
larva				X		X	X	X
adult/spawning adult	X	X				X		X
Vermilion snapper								
egg						X	X	X
larva				X		X	X	X
juvenile		X						X
adult/spawning adult		X				X		X
Wahoo								
all lifestages					X			
Warsaw grouper								
egg						X	X	X
larva				X		X	X	X
adult/spawning adult						X		X

Table A-4 (*continued*)
EFH Habitats by Species and Lifestages for Site B Corridor.

Species/ Lifestage	Benthic Substrate (not including hard bottom substrate)	Live/Hard Bottom	Artificial Reef	Pelagic *Sargassum*	Currents	Water Column	Nearshore	HAPC
White grunt								
egg						X	X	X
larva				X		X	X	X
juvenile		X					X	X
adult/spawning adult		X				X	X	X
White shrimp								
egg	X	X					X	X
larva						X	X	X
juvenile							X	X
adult	X						X	X
Wreckfish								
larva				X			X	X
juvenile						X	X	X
adult/spawning adult								X
Yellowedge grouper								
egg						X	X	X
larva				X	X	X	X	X
adult/spawning adult								X
Atlantic sharpnose shark								
neonate & early juvenile						X	X	
late juvenile & subadult						X	X	

Table A-4 (*continued*)
EFH Habitats by Species and Lifestages for Site B Corridor.

Species/ Lifestage	Benthic Substrate (not including hard bottom substrate)	Live/Hard Bottom	Artificial Reef	Pelagic *Sargassum*	Currents	Water Column	Nearshore	HAPC
Blacknose shark								
neonate & early juvenile						X	X	
Blacktip shark								
neonate						X	X	
juvenile						X	X	
Bluefin tuna								
spawning adult, egg, & larva						X		
Bonnethead shark								
late juvenile & subadult						X	X	
adult						X	X	
Dusky shark								
juvenile						X	X	
adult						X		

Table A-4 (*continued*)
EFH Habitats by Species and Lifestages for Site B Corridor.

Species/ Lifestage	Benthic Substrate (not including hard bottom substrate)	Live/Hard Bottom	Artificial Reef	Pelagic *Sargassum*	Currents	Water Column	Nearshore	HAPC
Finetooth shark								
neonate						X	X	
juvenile						X	X	
adult						X	X	
Lemon shark								
late juvenile & subadult						X	X	
Sailfish								
adult						X	X	
Sand tiger shark								
neonate & early juvenile						X	X	
Sandbar shark								
neonate	X	X				X	X	
juvenile	X	X				X	X	
adult	X	X				X	X	

Table A-4 (*continued*)
EFH Habitats by Species and Lifestages for Site B Corridor.

Species/ Lifestage	Benthic Substrates (not including hard bottom substrate)	Live/Hard Bottom	Artificial Reef	Pelagic *Sargassum*	Currents	Water Column	Nearshore	HAPC
Scalloped hammerhead shark								
neonate & early juvenile							X	
late juvenile & subadult						X	X	
Spinner shark								
neonate & early juvenile						X	X	
Swordfish								
juvenile & subadult						X		
Tiger shark								
neonate & early juvenile	X	X				X	X	
late juvenile & subadult	X	X				X	X	
adult					X	X		

Table A-5
EFH Habitats by Species and Lifestages for Site C Range.

Species/ Lifestage	Benthic Substrate (not including hard bottom substrate)	Live/Hard Bottom	Artificial Reef	Pelagic *Sargassum*	Currents	Water Column	HAPC
Bluefish							
egg						X	
larva					X	X	
juvenile					X	X	
adult						X	
Summer flounder							
egg						X	
larva						X	
juvenile						X	
adult						X	
Spiny dogfish							
juvenile						X	
adult						X	
Atlantic calico scallop							
larva					X		
all lifestages	X						
Blackfin snapper							
larva				X	X		X
juvenile		X					X
adult/spawning adult		X				X	X

Table A-5 (*continued*)
EFH Habitats by Species and Lifestages for Site C Range.

Species/ Lifestage	Benthic Substrate (not including hard bottom substrate)	Live/Hard Bottom	Artificial Reef	Pelagic *Sargassum*	Currents	Water Column	HAPC
Blueline tilefish							
egg						X	X
larva					X	X	X
adult/spawning adult	X					X	X
Brown rock shrimp							
larva					X		
adult	X						
Brown shrimp							
egg	X	X					
larva						X	
adult	X						
Caribbean spiny lobster							
larva					X		
all lifestages	X	X				X	
Cobia							
larva					X		X
all lifestages	X			X			X
Corals							
all lifestages		X					X
Dolphinfish							
all lifestages					X		X

Table A-5 (*continued*)
EFH Habitats by Species and Lifestages for Site C Range.

Species/ Lifestage	Benthic Substrate (not including hard bottom substrate)	Live/Hard Bottom	Artificial Reef	Pelagic *Sargassum*	Currents	Water Column	HAPC
Pompano dolphinfish							
all lifestages					X		X
Golden deepsea crab							
larva					X		
all lifestages	X						
Greater amberjack							
larva				X	X		X
juvenile				X			X
adult/spawning adult			X				X
Goliath grouper							
larva							X
juvenile							X
adult							X
Gray snapper							
egg						X	X
larva				X	X	X	X
juvenile			X				X
adult/spawning adult		X	X			X	X
King mackerel							
larva					X		X
all lifestages	X			X			X

Table A-5 (*continued*)
EFH Habitats by Species and Lifestages for Site C Range.

Species/ Lifestage	Benthic Substrate (not including hard bottom substrate)	Live/Hard Bottom	Artificial Reef	Pelagic *Sargassum*	Currents	Water Column	HAPC
Mutton snapper							
egg							X
larva							X
juvenile							X
adult/spawning adult							X
Pink shrimp							
adult	X						
Red drum							
adult	X		X				
Red porgy							
egg						X	X
larva				X	X	X	X
adult/spawning adult	X	X				X	X
Red snapper							
egg						X	X
larva				X	X	X	X
adult/spawning adult	X	X				X	X
Royal red shrimp							
larva					X		
adult	X						

Table A-5 (*continued*)
EFH Habitats by Species and Lifestages for Site C Range.

Species/ Lifestage	Benthic Substrate (not including hard bottom substrate)	Live/Hard Bottom	Artificial Reef	Pelagic *Sargassum*	Currents	Water Column	HAPC
Scamp							
larva				X	X	X	X
adult/spawning adult		X				X	X
Silk snapper							
larva				X	X		X
juvenile		X	X				X
adult/spawning adult		X				X	X
Snowy grouper							
egg						X	X
larva				X	X		X
adult/spawning adult	X	X					X
Speckled hind							
larva				X	X	X	X
adult/spawning adult	X	X				X	X
Spanish mackerel							
larva						X	X
all lifestages	X			X			X
Tilefish							
larva				X	X	X	X
adult/spawning adult							X

Table A-5 (*continued*)
EFH Habitats by Species and Lifestages for Site C Range.

Species/ Lifestage	Benthic Substrate (not including hard bottom substrate)	Live/Hard Bottom	Artificial Reef	Pelagic *Sargassum*	Currents	Water Column	HAPC
Vermilion snapper							
egg						X	X
larva				X	X	X	X
juvenile		X					X
adult/spawning adult		X				X	X
Wahoo							
all lifestages					X		X
Warsaw grouper							
egg						X	X
larva				X	X	X	X
adult/spawning adult		X				X	X
White grunt							
egg						X	X
larva				X	X	X	X
juvenile		X					X
adult/spawning adult							X
Wreckfish							
larva				X	X		X
juvenile						X	X
adult/spawning adult							X

Table A-5 (*continued*)
EFH Habitats by Species and Lifestages for Site C Range.

Species/ Lifestage	Benthic Substrate (not including hard bottom substrate)	Live/Hard Bottom	Artificial Reef	Pelagic *Sargassum*	Currents	Water Column	HAPC
Yellowedge grouper							
egg						X	X
larva				X	X	X	X
adult/spawning adult	X	X				X	X
Atlantic sharpnose shark							
late juvenile & subadult						X	
adult						X	
Bignose shark							
neonate & early juvenile						X	
late juvenile & subadult						X	
Blacktip shark							
juvenile						X	
Blue marlin							
juvenile & subadult						X	
adult						X	
Bluefin tuna							
spawning adult, egg, & larva						X	

Table A-5 (*continued*)
EFH Habitats by Species and Lifestages for Site C Range.

Species/ Lifestage	Benthic Substrate (not including hard bottom substrate)	Live/Hard Bottom	Artificial Reef	Pelagic *Sargassum*	Currents	Water Column	HAPC
Dusky shark							
neonate						X	
juvenile						X	
adult						X	
Longfin mako shark							
neonate & early juvenile	X	X				X	
juvenile & subadult	X	X				X	
adult	X	X				X	
Night shark							
late juvenile & subadult	X	X				X	
adult	X	X				X	
Oceanic whitetip shark							
adult						X	
Sailfish							
adult						X	
Sand tiger shark							
neonate & early juvenile						X	
Sandbar shark							
juvenile	X	X				X	
adult	X	X				X	

Table A-5 (*continued*)
EFH Habitats by Species and Lifestages for Site C Range.

Species/ Lifestage	**Benthic Substrate (not including hard bottom substrate)**	**Live/Hard Bottom**	**Artificial Reef**	**Pelagic *Sargassum***	**Currents**	**Water Column**	**HAPC**
Scalloped hammerhead shark							
late juvenile & subadult						X	
adult						X	
Shortfin mako							
late juvenile & subadult	X	X				X	
Silky shark							
neonate & early juvenile						X	
late juvenile & subadult						X	
Swordfish							
spawning adult, egg, & larva					X	X	
juvenile & subadult						X	
adult						X	
Tiger shark							
neonate & early juvenile	X	X				X	
late juvenile & subadult	X	X				X	
adult					X	X	
White marlin							
juvenile & subadult						X	
adult						X	

Table A-5 (*continued*)
EFH Habitats by Species and Lifestages for Site C Range.

Species/ Lifestage	**Benthic Substrate (not including hard bottom substrate)**	**Live/Hard Bottom**	**Artificial Reef**	**Pelagic *Sargassum***	**Currents**	**Water Column**	**HAPC**
Yellowfin tuna							
juvenile & subadult						X	
adult						X	

Table A-6
EFH Habitats by Species and Lifestages for Site C Corridor.

Species/ Lifestage	Benthic Substrate (not including hard bottom substrate)	Live/Hard Bottom	Artificial Reef	Pelagic *Sargassum*	Currents	Water Column	Nearshore	HAPC
Bluefish								
egg						X	X	
larva						X		
juvenile						X	X	
adult							X	
Spiny dogfish								
juvenile						X	X	
adult						X	X	
Summer flounder								
egg						X	X	
larva						X	X	
juvenile						X	X	X
adult						X	X	X
Atlantic calico scallop								
larva							X	
all lifestages	X				X			

Table A-6 (*continued*)
EFH Habitats by Species and Lifestages for Site C Corridor.

Species/ Lifestage	**Benthic Substrate (not including hard bottom substrate)**	**Live/Hard Bottom**	**Artificial Reef**	**Pelagic *Sargassum***	**Currents**	**Water Column**	**Nearshore**	**HAPC**
Blackfin snapper								
larva				X			X	X
juvenile		X					X	X
adult/spawning adult						X		X
Blueline tilefish								
egg						X	X	X
larva						X	X	X
adult/spawning adult						X		X
Brown rock shrimp								
larva					X			
adult	X							
Brown shrimp								
egg	X	X					X	X
larva						X	X	X
juvenile							X	X
adult	X						X	X
Caribbean spiny lobster								
larva					X			
all lifestages	X	X				X	X	
Cobia								
larva					X			X
all lifestages	X			X			X	X

Table A-6 (*continued*)
EFH Habitats by Species and Lifestages for Site C Corridor.

Species/ Lifestage	Benthic Substrates (not including hard bottom substrate)	Live/Hard Bottom	Artificial Reef	Pelagic *Sargassum*	Currents	Water Column	Nearshore	HAPC
Corals								
all lifestages		X					X	X
Dolphinfish								
all lifestages					X			X
Pompano dolphinfish								
all lifestages					X			X
Golden deepsea crab								
larva					X			
all lifestages	X							
Goliath grouper								
larva								X
juvenile								X
adult								X
Gray snapper								
egg						X	X	X
larva				X		X	X	X
juvenile	X	X	X				X	X
adult/spawning adult		X	X			X	X	X
Greater amberjack								
larva				X			X	X
juvenile				X			X	X
adult/spawning adult			X			X	X	X

Table A-6 (*continued*)
EFH Habitats by Species and Lifestages for Site C Corridor.

Species/ Lifestage	Benthic Substrate (not including hard bottom substrate)	Live/Hard Bottom	Artificial Reef	Pelagic *Sargassum*	Currents	Water Column	Nearshore	HAPC
King mackerel								
larva					X			X
all lifestages	X			X			X	X
Mutton snapper								
egg								X
larva								X
juvenile								X
adult/spawning adult								X
Pink shrimp								
egg	X	X					X	X
larva						X	X	X
juvenile							X	X
adult	X							X
Red drum								
adult			X				X	X
all other lifestages							X	X
Red porgy								
egg						X	X	X
larva				X		X	X	X
adult/spawning adult	X	X				X		X

Table A-6 (*continued*)
EFH Habitats by Species and Lifestages for Site C Corridor.

Species/ Lifestage	Benthic Substrate (not including hard bottom substrate)	Live/Hard Bottom	Artificial Reef	Pelagic *Sargassum*	Currents	Water Column	Nearshore	HAPC
Red snapper								
egg						X	X	X
larva				X		X	X	X
adult/spawning adult	X	X				X	X	X
Royal red shrimp								
larva					X			
adult	X							
Scamp								
larva				X		X	X	X
adult/spawning adult		X				X		X
Silk snapper								
larva				X			X	X
juvenile		X	X				X	X
adult/spawning adult								X
Snowy grouper								
egg						X	X	X
larva				X			X	X
adult/spawning adult	X	X					X	X
Spanish mackerel								
larva					X			X
all lifestages	X			X			X	X

Table A-6 (*continued*)
EFH Habitats by Species and Lifestages for Site C Corridor.

Species/ Lifestage	Benthic Substrate (not including hard bottom substrate)	Live/Hard Bottom	Artificial Reef	Pelagic *Sargassum*	Currents	Water Column	Nearshore	HAPC
Speckled hind								
larva				X		X	X	X
adult/spawning adult	X	X				X		X
Tilefish								
larva				X		X	X	X
adult/spawning adult								X
Vermilion snapper								
egg						X	X	X
larva				X		X	X	X
juvenile		X						X
adult/spawning adult		X				X		X
Wahoo								
all lifestages					X			X
Warsaw grouper								
egg						X	X	X
larva				X		X	X	X
adult/spawning adult						X		X
White grunt								
egg						X	X	X
larva				X		X	X	X
juvenile		X					X	X
adult/spawning adult		X				X	X	X

Table A-6 (*continued*)
EFH Habitats by Species and Lifestages for Site C Corridor.

pecies/ Lifestage	Benthic Substrate (not including hard bottom substrate)	Live/Hard Bottom	Artificial Reef	Pelagic *Sargassum*	Currents	Water Column	Nearshore	HAPC
White shrimp								
egg	X	X					X	X
larva						X	X	X
juvenile							X	X
adult	X						X	X
Wreckfish								
larva				X				X
juvenile						X	X	X
adult/spawning adult								X
Yellowedge grouper								
egg						X	X	X
larva				X	X	X	X	X
adult/spawning adult								X
Atlantic sharpnose shark								
neonate & early juvenile						X	X	
late juvenile & subadult						X	X	
adult						X		
Bignose shark								
neonate & early juvenile							X	
late juvenile & subadult							X	
Blacktip shark								
juvenile							X	

Table A-6 (*continued*)
EFH Habitats by Species and Lifestages for Site C Corridor.

Species/ Lifestage	Benthic Substrate (not including hard bottom substrate)	Live/Hard Bottom	Artificial Reef	Pelagic *Sargassum*	Currents	Water Column	Nearshore	HAPC
Bluefin tuna								
juvenile & subadult						X		
adult						X		
Dusky shark								
neonate						X		
juvenile						X	X	
adult						X		
Finetooth shark								
juvenile						X	X	
adult						X	X	
Longfin mako shark								
neonate & early juvenile	X	X				X		
juvenile & subadult	X	X				X		
adult	X	X				X		
Night shark								
late juvenile & subadult	X	X				X		
adult	X	X				X		
Sailfish								
adult						X	X	
Sand tiger shark								
neonate & early juvenile						X	X	

Table A-6 (*continued*)
EFH Habitats by Species and Lifestages for Site C Corridor.

Species/ Lifestage	Benthic Substrate (not including hard bottom substrate)	Live/Hard Bottom	Artificial Reef	Pelagic *Sargassum*	Currents	Water Column	Nearshore	HAPC
Sandbar shark								
neonate	X	X				X	X	
juvenile	X	X				X	X	
adult	X	X				X	X	
Scalloped hammerhead shark								
late juvenile & subadult						X	X	
adult						X		
Shortfin mako								
late juvenile & subadult	X	X				X		
Silky shark								
neonate & early juvenile						X		
late juvenile & subadult						X		
Spinner shark								
neonate & early juvenile						X	X	
Swordfish								
spawning adult, egg, & larva					X	X		
juvenile & subadult						X		
adult								

Table A-6 (*continued*)
EFH Habitats by Species and Lifestages for Site C Corridor.

Species/ Lifestage	Benthic Substrate (not including hard bottom substrate)	Live/Hard Bottom	Artificial Reef	Pelagic *Sargassum*	Currents	Water Column	Nearshore	HAPC
Tiger shark								
neonate & early juvenile	X	X				X	X	
late juvenile & subadult	X	X				X		
adult					X	X		
White marlin								
juvenile & subadult						X		
adult						X		

Table A-7
EFH Habitats by Species and Lifestages for Site D Range.

Species/ Lifestage	Benthic Substrate (not including hard bottom substrate)	Live/Hard Bottom	Artificial Reef	Biogenic Reef Community	Pelagic *Sargassum*	Currents	Water Column	HAPC
Atlantic herring								
adult/spawning adult	X	X					X	
Atlantic mackerel								
Larva							X	
Juvenile							X	
Adult							X	
Atlantic surfclam								
Juvenile	X	X						
adult	X	X						
Black sea bass								
larva							X	
juvenile	X	X		X			X	
adult	X	X		X			X	
Bluefish								
egg							X	
larva							X	
juvenile							X	
adult							X	
Butterfish								
egg							X	
larva							X	
juvenile							X	
adult							X	

Table A-7 (*continued*)
EFH Habitats by Species and Lifestages for Site D Range.

Species/ Lifestage	Benthic Substrate (not including hard bottom substrate)	Live/Hard Bottom	Artificial Reef	Biogenic Reef Community	Pelagic *Sargassum*	Currents	Water Column	HAPC
Goosefish/monkfish								
egg							X	
larva							X	
juvenile	X							
adult/spawning adult	X							
Haddock								
larva							X	
Little skate								
egg	X							
juvenile	X							
Longfin inshore squid								
juvenile							X	
adult							X	
Northern shortfin squid								
juvenile							X	
adult							X	
Ocean quahog								
juvenile	X	X						
adult	X	X						
Offshore hake								
egg							X	
larva							X	
juvenile	X	X					X	
adult/spawning adult	X	X					X	

Table A-7 (*continued*)
EFH Habitats by Species and Lifestages for Site D Range.

Species/ Lifestage	Benthic Substrate (not including hard bottom substrate)	Live/Hard Bottom	Artificial Reef	Pelagic *Sargassum*	Currents	Water Column	HAPC
Red deepsea crab							
egg	X						
larva						X	
juvenile	X						
adult/spawning adult	X						
Red hake							
egg						X	
larva						X	
juvenile	X						
adult/spawning adult	X						
Rosette skate							
juvenile	X						
Scup							
juvenile						X	
adult						X	
Sea scallop							
egg	X						
larva	X					X	
juvenile	X						
adult/spawning adult	X						
Silver hake/whiting							
egg						X	
larva						X	
juvenile	X	X					
adult/spawning adult	X	X					

Table A-7 (*continued*)
EFH Habitats by Species and Lifestages for Site D Range.

Species/ Lifestage	Benthic Substrate (not including hard bottom substrate)	Live/Hard Bottom	Artificial Reef	Pelagic *Sargassum*	Currents	Water Column	HAPC
Spiny dogfish							
juvenile						X	
adult						X	
Summer flounder							
egg						X	
larva						X	
juvenile	X					X	
adult	X					X	
Tilefish							
egg						X	
larva						X	
juvenile						X	
adult						X	
spawning adult						X	
Windowpane flounder							
larva						X	
adult/spawning adult	X						
Witch flounder							
egg						X	
larva						X	
juvenile	X						

Table A-7 (*continued*)
EFH Habitats by Species and Lifestages for Site D Range.

Species/ Lifestage	Benthic Substrate (not including hard bottom substrate)	Live/Hard Bottom	Artificial Reef	Pelagic *Sargassum*	Currents	Water Column	HAPC
Yellowtail flounder							
egg						X	
larva						X	
juvenile	X						
Cobia							
all lifestages	X			X			X
King mackerel							
all lifestages	X			X			X
Spanish mackerel							
all lifestages	X			X			X
Red drum							
adult	X						
Albacore tuna							
juvenile & subadult						X	
adult						X	
Basking shark							
late juvenile & subadult					X	X	
Bigeye tuna							
juvenile & subadult						X	
adult						X	

Table A-7 (*continued*)
EFH Habitats by Species and Lifestages for Site D Range.

Species/ Lifestage	Benthic Substrate (not including hard bottom substrate)	Live/Hard Bottom	Artificial Reef	Pelagic *Sargassum*	Currents	Water Column	HAPC
Bignose shark							
neonate & early juvenile	X	X				X	
late juvenile & subadult	X	X				X	
Blue marlin							
juvenile & subadult						X	
adult						X	
Blue shark							
late juvenile & subadult						X	
adult						X	
Bluefin tuna							
juvenile & subadult						X	
adult						X	
Dusky shark							
juvenile						X	
Longfin mako shark							
neonate & early juvenile	X	X				X	
juvenile & subadult	X	X				X	
adult	X	X				X	
Night shark							
late juvenile & subadult	X	X				X	
Sandbar shark							
juvenile	X	X				X	
adult	X	X				X	

Table A-7 (*continued*)
EFH Habitats by Species and Lifestages for Site D Range.

Species/ Lifestage	Benthic Substrate (not including hard bottom substrate)	Live/Hard Bottom	Artificial Reef	Pelagic *Sargassum*	Currents	Water Column	HAPC
Scalloped hammerhead shark							
late juvenile & subadult						X	
Shortfin mako							
neonate & early juvenile	X	X				X	
late juvenile & subadult	X	X				X	
adult	X	X				X	
Skipjack tuna							
adult						X	
Swordfish							
juvenile & subadult						X	
adult						X	
Tiger shark							
neonate & early juvenile	X	X				X	
late juvenile & subadult	X	X				X	
White marlin							
juvenile & subadult						X	
adult						X	
Yellowfin tuna							
juvenile & subadult						X	
adult						X	

Table A-8
EFH Habitats by Species and Lifestages for Site D Corridor

Species/ Lifestage	Benthic Substrate (not including hard bottom substrate)	Live/Hard Bottom	Artificial Reef	Pelagic *Sargassum*	Currents	Water Column	Nearshore	HAPC
Atlantic herring								
juvenile	X	X				X		
adult/spawning adult	X	X				X	X	
Atlantic mackerel								
larva						X		
adult						X		
Atlantic surfclam								
juvenile	X	X					X	
adult	X	X						
Black sea bass								
larva						X	X	
juvenile						X	X	
adult		X	X			X	X	
Bluefish								
egg						X		
larva						X	X	
juvenile						X	X	
adult							X	
Butterfish								
egg						X		
larva						X		
juvenile						X	X	
adult						X	X	

Table A-8 (*continued)*
EFH Habitats by Species and Lifestages for Site D Corridor.

Species/ Lifestage	Benthic Substrate (not including hard bottom substrate)	Live/Hard Bottom	Artificial Reef	Pelagic *Sargassum*	Currents	Water Column	Nearshore	HAPC
Clearnose skate								
juvenile	X						X	
adult	X						X	
Goosefish/monkfish								
egg						X	X	
larva						X	X	
juvenile	X							
Little skate								
egg	X						X	
juvenile	X						X	
adult	X						X	
Longfin inshore squid								
juvenile						X		
adult						X		
Northern shortfin squid								
juvenile						X		
adult						X		
Ocean quahog								
juvenile	X	X						
adult	X	X						

Table A-8 (*continued)*
EFH Habitats by Species and Lifestages for Site D Corridor.

Species/ Lifestage	Benthic Substrate (not including hard bottom substrate)	Live/Hard Bottom	Artificial Reef	Pelagic *Sargassum*	Currents	Water Column	Nearshore	HAPC
Red hake								
egg						X	X	
larva						X	X	
juvenile	X						X	
adult/spawning adult	X							
Scup								
juvenile						X	X	
adult						X	X	
Sea scallop								
egg	X							
larva	X	X				X		
juvenile	X							
adult/spawning adult	X							
Silver hake/whiting								
egg						X		
larva						X		
juvenile	X	X						
adult/spawning adult	X	X						
Spiny dogfish								
juvenile						X	X	
adult						X	X	

Table A-8 (*continued*)
EFH Habitats by Species and Lifestages for Site D Corridor.

Species/ Lifestage	Benthic Substrate (not including hard bottom substrate)	Live/Hard Bottom	Artificial Reef	Pelagic *Sargassum*	Currents	Water Column	Nearshore	HAPC
Summer flounder								
egg						X		
larva						X		
juvenile						X	X	X
adult						X	X	X
Windowpane flounder								
egg						X	X	
larva						X	X	
juvenile	X						X	
adult/spawning adult	X						X	
Winter flounder								
juvenile	X						X	
Winter skate								
juvenile	X						X	
adult	X						X	
Witch flounder								
egg						X	X	
larva						X		
Yellowtail flounder								
egg						X		
larva						X		
juvenile	X							

Table A-8 (*continued)*
EFH Habitats by Species and Lifestages for Site D Corridor.

Species/ Lifestage	Benthic Substrate (not including hard bottom substrate)	Live/Hard Bottom	Artificial Reef	Pelagic *Sargassum*	Currents	Water Column	Nearshore	HAPC
King mackerel								
all lifestages	X			X			X	
Spanish mackerel								
all lifestages	X			X			X	
Red drum								
adult	X		X				X	
all other lifestages	X						X	
Atlantic sharpnose shark								
adult						X	X	
Blue shark								
late juvenile & subadult						X		
adult						X		
Bluefin tuna								
juvenile & subadult						X		
adult						X		

Table A-8 (*continued)*
EFH Habitats by Species and Lifestages for Site D Corridor.

Species/ Lifestage	Benthic Substrate (not including hard bottom substrate)	Live/Hard Bottom	Artificial Reef	Pelagic *Sargassum*	Currents	Water Column	Nearshore	HAPC
Dusky shark								
neonate						X	X	
juvenile						X	X	
Sand tiger shark								
neonate & early juvenile						X	X	
adult						X	X	
Sandbar shark								
neonate	X	X				X	X	
juvenile	X	X				X	X	
adult	X	X				X	X	
Scalloped hammerhead shark								
late juvenile & subadult						X	X	
Shortfin mako								
neonate & early juvenile	X	X				X		
late juvenile & subadult	X	X				X		
adult	X	X				X		
Skipjack tuna								
adult						X		
Swordfish								
juvenile & subadult						X		

Table A-8 (*continued*)
EFH Habitats by Species and Lifestages for Site D Corridor.

Species/ Lifestage	Benthic Substrate (not including hard bottom substrate)	Live/Hard Bottom	Artificial Reef	Pelagic *Sargassum*	Currents	Water Column	Nearshore	HAPC
Tiger shark								
neonate & early juvenile	X	X				X	X	
late juvenile & subadult	X	X				X		

APPENDIX B: AREA ESTIMATES

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Appendix B: Area Estimations for Impact Analysis

The following dimensions and values were used to estimate the area of impact at each of the four proposed USWTR sites by the installation process. All length/distance estimates are in kilometers (km) and all area estimates are in square kilometers (km^2). The area of each habitat type is taken from Table 1-2.

Sites A, B, C, and D

Interconnect cable pathway width (burying the cable) = 0.005 km (0.003 NM)
Interconnect cable length = 1,110 km (600 NM)
Interconnect cable estimated impact area (if buried) = 5.55 km^2 (1.62 NM^2)

Interconnect cable diameter = 0.000031 km
Interconnect cable estimated impact area (laying the cable) = 0.034 km^2 (0.010 NM^2)

Number of transducers = 300
Estimated area of one transducer = 0.000005 km^2 (0.000001 NM^2)
Total estimated transducer impact area = 0.0015 km^2 (0.0004 NM^2)

Total estimated impact area in range (interconnect cable + transducers) = 5.5515 km^2 (1.62 NM^2)

Trunk cable pathway width = 0.005 km (0.003 NM)

Site A Range JAX

Area of USWTR Site A = 1,535 km^2 (448 NM^2)

Area of live/hard bottom = 600 km^2 (175 NM^2)
Percent of live/hard bottom impacted by burying the interconnect cable= 5.55 km^2 / 600 km^2 x 100 = 0.92%
Percent of live/hard bottom impacted by laying the interconnect cable = 0.034 km^2 / 600 km^2 x 100 = 0.006%

Area of benthic substrate (not including live/hard bottom substrate) = 935 km^2 (273 NM^2)
Percent of benthic substrate (not including live/hard bottom substrate) impacted = 5.55 km^2 / 935 km^2 x 100 = 0.59%

Site A Corridor JAX

Area of Site A corridor = 2,085 km^2 (608 NM^2)
Distance from shore to range = 94 km (51 NM)
Trunk cable estimated impact area = 94 km x 0.005 km = 0.47 km^2 (0.14 NM^2)

Area of live/hard bottom = 197 km^2 (57 NM^2)

Percent of live/hard bottom impacted = 0.47 km^2 / 197 km^2 x 100 = 0.24%

Area of benthic substrate (not including live/hard bottom substrate) = 1,888 km^2 (550 NM^2)

Percent of benthic substrate (not including live/hard bottom substrate) impacted = 0.47 km^2 / 1,888 km^2 x 100 = 0.02%

Area of nearshore corridor = 6.9 km^2 (2.0 NM^2)

Area of longest 5 m wide pathway in nearshore corridor = 0.03 km^2 (0.009 NM^2)

Percent of nearshore corridor impacted by 5 m wide pathway = 0.03 km^2 / 6.9 km^2 x 100 = 0.43%

Site B Range CHASN

Area of USWTR Site B = 1,471 km^2 (429 NM^2)

Area of live/hard bottom = 186 km^2 (54 NM^2)

Percent of live/hard bottom impacted by burying the interconnect cable= 5.55 km^2 / 186 km^2 x 100 = 2.98%

Percent of live/hard bottom impacted by laying the interconnect cable = 0.034 km^2 / 186 km^2 x 100 = 0.02%

Area of benthic substrate (not including hard bottom substrate) = 1,285 km^2 (375 NM^2)

Percent of benthic substrate (not including hard bottom substrate) impacted = 5.55 km^2 / 1,285 km^2 x 100 = 0.43%

Site B Corridor CHASN

Area of Site B corridor = 1,217 km^2 (355 NM^2)

Distance from shore to range = 92 km (50 NM)

Trunk cable estimated impact area = 92 km x 0.005 km = 0.46 km^2 (0.13 NM^2)

Area of live/hard bottom = 270 km^2 (79 NM^2)

Percent of live/hard bottom impacted = 0.46 km^2 / 270 km^2 x 100 = 0.17%

Area of benthic substrate (not including live/hard bottom substrate) = 947 km^2 (276 NM^2)

Percent of benthic substrate (not including live/hard bottom substrate) impacted = 0.46 km^2 / 947 km^2 x 100 = 0.049%

Area of nearshore corridor = 8.37 km^2 (2.44 NM^2)

Area of longest 5 m wide pathway in nearshore corridor = 0.04 km^2 (0.01 NM^2)

Percent of nearshore corridor impacted by 5 m wide pathway = 0.04 km^2 / 8.37 km^2 x 100 = 0.48%

Site C Range CHPT

Area of Site C corridor = 1,639 km^2 (478 NM^2)

Area of live/hard bottom = 105 km^2 (232 NM^2)

Percent of live/hard bottom impacted by burying the interconnect cable = 5.55 km^2 / 105 km^2 x 100 = 5.29%

Percent of live/hard bottom impacted by laying the interconnect cable = 0.034 km^2 / 105 km^2 x 100 = 0.032%

Area of benthic substrate (not including live/hard bottom substrate) = 1,534 km^2 (447 NM^2)

Percent of benthic substrate (not including live/hard bottom substrate) impacted = 5.55 km^2 / 1,534 km^2 x 100 = 0.36%

Site C Corridor CHPT

Area of Site C corridor = 1,835 km^2 (535 NM^2)

Distance from shore to range = 88 km (48 NM)

Trunk cable estimated impact area = 88 km x 0.005 km = 0.44 km^2 (0.13 NM^2)

Area of live/hard bottom = 204 km^2 (59 NM^2)

Percent of live/hard bottom impacted = 0.44 km^2 / 204 km^2 x 100 = 0.22%

Area of benthic substrate (not including live/hard bottom substrate) = 1,637 km^2 (477 NM^2)

Percent of benthic substrate (not including live/hard bottom substrate) impacted = 0.44 km^2 / 1,637 km^2 x 100 = 0.03%

Area of nearshore corridor = 6.9 km^2 (2.0 NM^2)

Area of longest 5 m wide pathway in nearshore corridor = 0.03 km^2 (0.009 NM^2)

Percent of nearshore corridor impacted by 5 m wide pathway = 0.03 km^2 / 6.9 km^2 x 100 = 0.43%

Site D Range VACAPES

Area of Site D corridor = 1,591 km^2 (478 NM^2)

Area of live/hard bottom = No known naturally occurring hard bottom in range

Percent of live/hard bottom impacted = N/A

Area of benthic substrate (not including live/hard bottom substrate) = 1,591 km^2 (464 NM^2)

Percent of benthic substrate (not including live/hard bottom substrate) impacted = 5.5515 km^2 / 1,591 km^2 x 100 = 0.35%

Site D Corridor VACAPES

Area of Site D corridor = 1,480 km^2 (535 NM^2)
Distance from shore to range = 90 km (49 NM)
Trunk cable estimated impact area = 90 km x 0.005 km = 0.45 km^2 (0.13 NM^2)

Area of hard bottom = No known naturally occurring hard bottom in corridor
Percent of hard bottom impacted = N/A

Area of benthic substrate (not including hard bottom substrate) = 1,480 km^2 (431 NM^2)
Percent of benthic substrate (not including hard bottom substrate) impacted = 0.45 km^2 / 1,480 km^2 x 100 = 0.03%

Area of nearshore corridor = 50.69 km^2 (14.8 NM^2)
Area of longest 5 m wide pathway in nearshore corridor= 0.08 km^2 (0.03 NM^2)
Percent of nearshore corridor impacted by 5 m wide pathway = 0.08 km^2 / 50.69 km^2 x 100 = 0.16%

APPENDIX C

UNDERWATER SOUND CONCEPTS

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C UNDERWATER SOUND CONCEPTS

C.1 What is Sound?

Subjectively, the term *sound* refers to what is heard with the ears. Objectively, sound is a time-varying mechanical disturbance in an elastic medium. In modern usage, sound refers not only to the phenomenon in air that one hears, but also to whatever else is governed by the same physical principles (Pierce, 1989).

Sound is produced when an elastic medium is set into motion, often by a vibrating object within the medium. As the object vibrates, its motion is transmitted to adjacent "particles" of the medium. The motion of these particles is transmitted to adjacent particles, and so on. The result is a mechanical disturbance (the "sound wave") that moves away from the source and propagates at a medium-dependent speed (the "sound speed"). As the sound wave travels through the medium, the individual particles of the medium oscillate about their static positions but do not propagate with the sound wave. As the particles of the medium move back and forth they create small changes, or perturbations, about the static values of the medium density, pressure, and temperature.

C.2 Physical and Subjective Attributes of Sound

Sounds may be described in terms of physical and subjective attributes. Physical attributes may be directly measured. Subjective (or psychophysical) attributes may not be directly measured and require a listener to make a judgment about the sound. Physical attributes of a sound at a particular point in space are normally quantified by measuring perturbations in the pressure of the medium that accompany the passage of a sound wave. Two of the most important physical attributes are frequency and amplitude.

Frequency is the physical attribute most closely associated with the subjective attribute ***pitch***; the higher the frequency, the higher the pitch. Frequency is related to the speed at which the medium particles oscillate about their static positions. Frequency is the number of times that the medium pressure varies from its static pressure through a complete cycle in unit time (Galloway, 1988). The unit of frequency is hertz (Hz); 1 Hz is equal to 1 cycle per second. Pure tones have a constant, single frequency. Complex tones contain sound energy at multiple, discrete frequencies, rather than a single frequency (ANSI, 1994).

Amplitude is the physical attribute most closely associated with the subjective attribute ***loudness***. Amplitude is related to the amount that the medium particles vary about their static positions. As the amplitude increases, the loudness also increases.

C.3 Impulsive and Continuous-Type Sounds

Although no standard definitions exist, sounds may be broadly categorized as ***impulsive*** or ***continuous-type***. All non-impulsive sounds (e.g., continuous, varying, intermittent) are collectively referred to as "continuous-type" (NIOSH, 1998). Impulsive sounds feature steep rises and high peaks in the medium pressure, followed by rapid return to the static pressure. Impulsive sounds have short durations and broad frequency content. Impulsive sounds are often produced by processes involving a rapid release of energy (e.g., chemical explosions) or mechanical impact (e.g., mechanical punch press or pile driving) (Hamernik and Hsueh, 1991).

Although they may have brief durations, most sonar "pings" may be considered to be continuous-type sounds because their durations are relatively long compared to their harmonic period — the time for the medium pressure to move through one complete cycle.

C.4 Sound Metrics

C.4.1 Sound Pressure

Sound pressure is the incremental variation in a medium's static pressure as a sound wave travels through it. The unit of sound pressure is the pascal (Pa) (1 Pa = 10 µbar = 1.45×10^{-4} psi).

Instantaneous sound pressure $p(t)$ is the total instantaneous pressure at a point minus the static pressure at that point (ANSI, 1994). Figure C-1 shows instantaneous sound pressures for a hypothetical (a) pure tone and (b) impulsive sound. Instantaneous sound pressure is a time-varying quantity. Standard descriptors used for time-varying quantities, such as the peak value or root-mean-squared value, are also used to describe the instantaneous sound pressure.

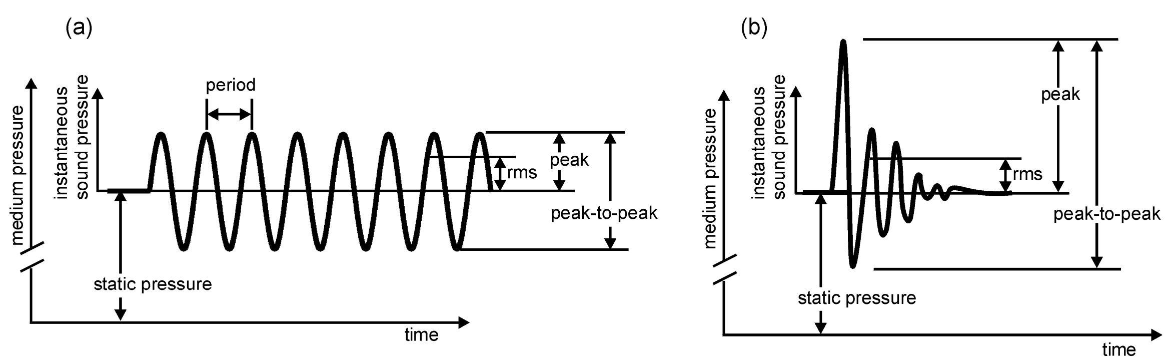

Figure C-1

Peak sound pressure is the maximum absolute value of the instantaneous sound pressure during a specified time interval (ANSI, 1994). The ***peak-to-peak (p-p) sound pressure*** is the difference between the maximum and minimum values of the instantaneous sound pressure.

The ***mean-squared sound pressure*** $\overline{P^2}$ is

$$\overline{P^2} = \frac{1}{T}\int_0^T p^2(t)\,dt\,, \tag{C-1}$$

where T is the time over which $p^2(t)$ is integrated. For impulsive sounds the "effective duration" may be defined using different criteria (see Hamernik and Hsueh, 1991). For periodic sounds it is common to integrate over an integral number of periods. For other continuous-type sounds it is common to integrate over long time periods. The unit of $\overline{P^2}$ is pascal-squared (Pa^2).

Since $\overline{P^2}$ does not have the same physical units as $p(t)$, the ***root-mean-squared (rms) sound pressure*** is often used instead. The rms sound pressure $\overline{P}$ is the square-root of the mean-squared sound pressure:

$$\overline{P} = \sqrt{\frac{1}{T}\int_0^T p^2(t)\,dt}\,. \tag{C-2}$$

For pure tones (with T equal to an integral number of periods), Eq. (C-2) simplifies to $\overline{P} = P_p/\sqrt{2}$, where P_p is the peak sound pressure. This relation may not hold for more complex sounds. In general, $\overline{P}$ must be calculated from Eq. (C-2) using $p(t)$ for the specific sound of interest.

C.4.1.1 Sound Levels and Decibels

Because mammalian ears possess a large dynamic range and humans judge the relative loudness of sounds by the ratio of the sound pressures (a logarithmic behavior), it is common to describe physical attributes of sounds with logarithmic units called ***sound levels*** (Kinsler *et al.*, 1982). The term "level" indicates the logarithm of the ratio of a given quantity divided by some reference quantity with the same units (ANSI, 1994; Young, 1988). The use of a logarithmic scale compresses the range of numerical values that must be used.

When using logarithmic units, the base of the logarithm and the reference value must be specified. Typically, the logarithm is taken to the base 10, so the logarithm is written as $\log_{10}$. The logarithm of a number y to a base b is the exponent x required so that b raised to the $x = y$: if $x = \log_b y$, then $y = b^x$. As an example, $\log_{10}(100) = 2$, since $10^2 = 100$. Some important mathematical relations involving logarithms are:

- $\log_b(xy) = \log_b x + \log_b y$
- $\log_b(x/y) = \log_b x - \log_b y$
- $\log_b x^a = a\log_b x$

Sound levels are normally expressed in ***decibels***. A decibel is 1/10 of a bel, a unit of level when the logarithm is to the base ten and the quantities concerned are proportional to power (ANSI, 1994).

To express a quantity *X* in decibels using a reference X_{ref}, the equation is

$$10\log_{10}\left(\frac{X}{X_{ref}}\right), \tag{C-3}$$

if *X* and X_{ref} have units of power or energy, or

$$20\log_{10}\left(\frac{X}{X_{ref}}\right) = 10\log_{10}\left(\frac{X^2}{X_{ref}^2}\right), \tag{C-4}$$

if *X* and X_{ref} have units of pressure, force, velocity, voltage, or a similar quantity. The use of X^2 and X_{ref}^2 arises because power is related to the product of pressure and velocity, force and velocity, voltage and current, etc.

When a numeric value is presented in decibels, it is important to also specify the numeric value and units of the reference quantity. Normally the numeric value is given, followed by the text “re”, meaning “with reference to”, and the numeric value and unit of the reference quantity (Harris, 1998). For example, a pressure of 1 Pa, expressed in decibels with a reference of 1 µPa, is written 120 dB re 1 µPa.

C.4.1.2 Sound Pressure Level

The most common sound level is ***sound pressure level*** (SPL). SPL is defined as

$$SPL = 10\log_{10}\left(\frac{\overline{P^2}}{P_{ref}^2}\right) = 20\log_{10}\left(\frac{\overline{P}}{P_{ref}}\right). \tag{C-5}$$

The standard reference pressure P_{ref} is 1 µPa for water (and media other than gases) and 20 µPa for air (and other gases) (ANSI, 1994). The different reference pressures for air and water means that the same sound pressure will result in different numeric values of SPL in-air and underwater.

C.4.2 Impulse

Impulse is the time integral of a force over the time that the force is applied (ANSI, 1994). ***Acoustic impulse*** I_a, or "impulse per unit area of $p(t)$" (Hamernik and Hsueh, 1991), is defined as

$$I_a = \int_0^T p(t)\, dt \,, \tag{C-6}$$

where T is the effective duration of the waveform. Often the "A-duration", defined as the time required for the instantaneous sound pressure in the initial wave to reach the peak pressure and then return to zero, is used (Hamernik and Hsueh, 1991). Impulse is often used in structural mechanics where the effects of impulsive loads must be taken into account (Hamernik and Hsueh, 1991), in certain source modeling situations (Marshall, 1996), and characterizing some effects of impulsive sounds on marine animals (Marshall, 1996; Yelverton *et al*., 1975). The unit of impulse is the pascal-second (Pa-s).

C.4.3 Sound Intensity

Sound energy transfer and power flow are often described in terms of the sound intensity. ***Sound intensity*** is the average rate of sound energy transported in a specified direction through a unit area perpendicular to the propagation direction. Power is energy per time, so sound intensity is equivalent to ***sound power flux density*** — a measure of the sound power transported through a unit area perpendicular to the propagation direction (Fahy, 1995). The units of sound intensity are watts per square-meter (W/m^2).

Instantaneous sound intensity is the product of the instantaneous sound pressure and instantaneous particle velocity. The instantaneous intensity consists of two parts: the *active intensity* associated with the particle velocity component in-phase with the sound pressure and the *reactive intensity*, which is associated with the particle velocity component in-quadrature (90º out-of-phase) with the sound pressure (Fahy, 1995). The term ***sound intensity*** normally refers to the time-averaged (mean) active intensity (Kinsler *et al*., 1982; Fahy, 1995); this quantity corresponds to local net transport of sound energy. In contrast, the reactive intensity represents local oscillatory transport of energy and has a mean of zero.

For a free plane or spherical wave, the sound intensity in the direction of propagation, I, is

$$I = \frac{\overline{P}^2}{\rho c} \,, \tag{C-7}$$

where ρ is the medium density and c is the sound speed (ANSI, 1994). Equation (C-7) is only valid for plane and spherical waves and does not apply to the general case, for which both sound pressure and particle velocity must be known to calculate sound intensity.

Sound intensity level (IL) is

$$IL = 10\log_{10}\left(\frac{I}{10^{-12}\ \text{W/m}^2}\right), \qquad \text{(C-8)}$$

where I is the sound intensity in a given direction (ANSI, 1994).

C.4.4 Sound Energy Flux Density

C.4.4.1 Energy Flux Density

Sound energy can also be described by the ***sound energy flux density*** (EFD). In contrast to sound intensity, which is sound *power* flow per unit area, EFD is the sound *energy* flow per unit area. EFD is defined as:

$$E = \int_0^T I(t)\,dt\,, \qquad \text{(C-9)}$$

where E is the energy flux density, $I(t)$ is the instantaneous acoustic intensity in a given direction and T is the duration of the sound (Urick, 1983). In practice, Eq. (C-9) is rarely used and plane waves are assumed. This makes $I(t) = p^2(t)/\rho c$ and

$$E = \int_0^T \frac{p^2(t)}{\rho c}\,dt\,. \qquad \text{(C-10)}$$

The units of EFD are joules per square-meter (J/m^2).

Note that Eq. (C-10) is only valid for plane waves. The plane wave assumption may not be valid under some conditions, especially underwater at low frequencies close to a sound source or in an enclosed space. Equation (C-10) is also problematic because sound speed may vary substantially underwater.

C.4.4.2 Energy Flux Density Level

Energy flux density level (EL) is calculated from

$$EL = 10\log_{10}\left(\frac{E}{E_{ref}}\right) = 10\log_{10}\left(\frac{\int_0^T p^2(t)/\rho c\, dt}{P_{ref}^2 T_{ref}/\rho c}\right), \tag{C-11}$$

where E_{ref} is the EFD of a plane wave with rms pressure P_{ref} and duration T_{ref}, in the same environment, so the factor ρc in E and E_{ref} cancel. For underwater applications, the reference quantities P_{ref} and T_{ref} are normally taken to be 1 μPa and 1 s, respectively (Marshall, 1996), so Eq. (C-11) becomes

$$EL = 10\log_{10}\left(\frac{\int_0^T p^2(t)\, dt}{(1\,\mu\text{Pa})^2(1\,\text{s})}\right), \tag{C-12}$$

and EL is in dB re 1 μPa^2-s. For airborne applications, P_{ref} = 20 μPa and EL is expressed in dB re (20 μPa)^2-s.

C.4.4.3 Relationship between EL, SPL, and Exposure Duration

Since $\overline{P^2} = 1/T\int_0^T p^2(t)\,dt$, Eq. (C-12) may be written

$$\begin{aligned} EL &= 10\log_{10}\left(\frac{\overline{P^2}T}{P_{ref}^2 T_{ref}}\right) \\ &= 10\log_{10}\left(\frac{\overline{P^2}}{P_{ref}^2}\right) + 10\log_{10}\left(\frac{T}{T_{ref}}\right) \\ &= SPL + 10\log_{10}\left(T/T_{ref}\right) \end{aligned} \tag{C-13}$$

If T_{ref} = 1 s, and T is the sound duration in seconds,

$$EL = SPL + 10\log_{10}(T). \tag{C-14}$$

Equation (C-14) reveals some important relationships between EL, SPL, and the sound duration:

- $\log_{10}(1) = 0$, so if the sound duration is 1 second, SPL and EL have the same numeric value (but not the same reference quantities). For example, a 1-second sound with an SPL of 100 dB re 1 μPa has an EL of 100 dB re 1 μPa^2-s.

- If the sound duration is constant but the SPL changes, EL will change by the same number of decibels as the SPL.

- If the SPL is held constant and the duration changes, EL will change as a function of $10\log_{10}(T)$:

    - $10\log_{10}(10) = 10$, so **increasing duration by a factor of 10 raises EL by 10 dB**.

    - $10\log_{10}(0.1) = -10$, so **decreasing duration by a factor of 10 lowers EL by 10 dB**.

    - Since $10\log_{10}(2) \approx 3$, **doubling the duration increases EL by 3 dB**.

    - $10\log_{10}(1/2) \approx -3$, so **halving the duration lowers EL by 3 dB**.

C.4.4.4 Total EFD for Multiple Exposures

The ***total energy flux density*** for multiple exposures is found by summing the energy flux densities of the individual exposures:

$$E = \sum_{n=1}^{N} E_n = \sum_{n=1}^{N} \left[\int_0^{T_n} \frac{p_n^2(t)}{\rho c} \, dt \right], \tag{C-15}$$

where N is the number of exposures and E_n, $p_n(t)$, and T_n are the energy flux density, instantaneous sound pressure, and duration of the n^{th} exposure, respectively.

Total energy flux density level is similarly defined:

$$EL = 10\log_{10}\left(\frac{\sum_{n=1}^{N} E_n}{P_{ref}^2 T_{ref}} \right). \tag{C-16}$$

Figure C-2 illustrates the summation of energy for a succession of sonar "pings". In this hypothetical case, each ping has the same duration and SPL. The EL at a particular location from each individual ping is 100 dB re 1 µPa^2-s (red circles). The upper, blue curve shows the running total or cumulative EL.

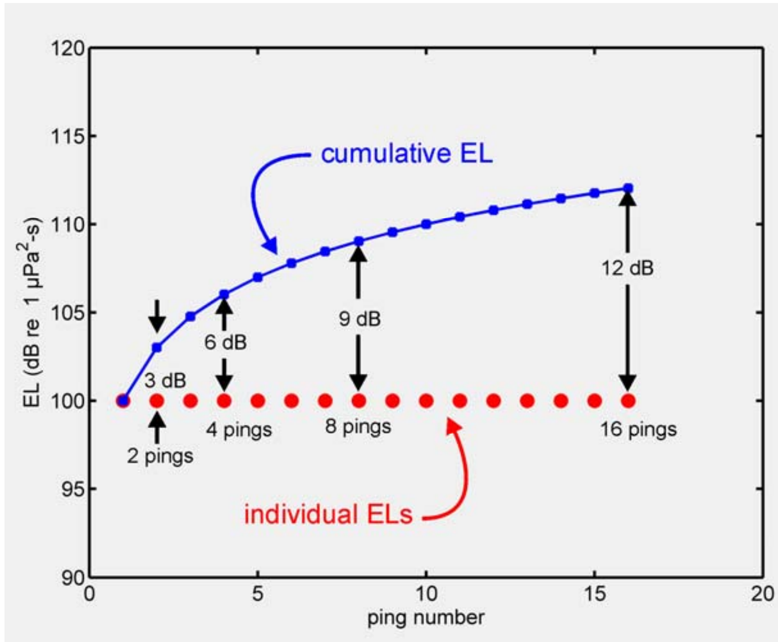

Figure C-2

After the first ping, the cumulative EL is 100 dB re 1 μPa^2-s. Since each ping has the same duration and SPL, receiving two pings is the same as receiving a single ping with twice the duration. The cumulative EL from two pings is therefore 103 dB re 1 μPa^2-s. The cumulative EL from four pings is 3 dB higher than the cumulative EL from two pings, or 106 dB re 1 μPa^2-s. Each doubling of the number of pings increases the cumulative EL by 3 dB.

Figure C-3 shows a more realistic example where the individual pings do not have the same SPL or EL. These data were recorded from a stationary hydrophone as a sound source approached, passed, and moved away from the hydrophone. As the source approached the hydrophone, the received SPL from each ping increased, causing the EL of each ping to increase. After the source passed the hydrophone, the received SPL and EL from each ping decreased as the source moved further away.

Although the cumulative EL increases with each additional ping received, the main contributions are from those pings with the highest individual ELs. Individual pings with ELs 10 dB or more below the ping with the highest level contribute little (less than 0.5 dB) to the total cumulative EL. This is shown in Fig. C-3 where only a small error is introduced by summing the energy from the 8 individual pings with EL > 185 dB re 1 μPa^2-s (black line), as opposed to including all pings (blue line).

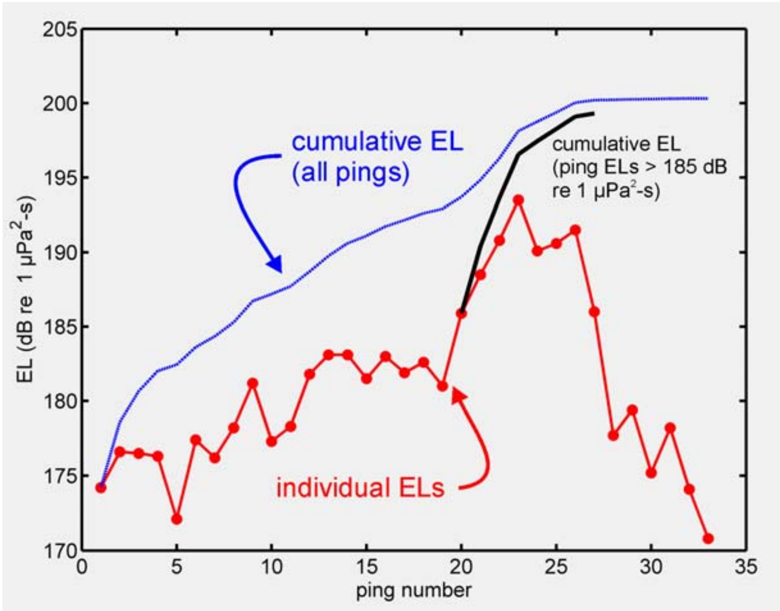

Figure C-3

C.4.5 Sound Exposure

Sound exposure (SE) is defined as

$$SE = \int_0^T p^2(t)\,dt\,, \tag{C-17}$$

and has units of pascal-squared seconds (Pa^2-s). Sound exposure and sound energy flux density are closely related and differ only by the factor of ρc.

The level quantity for sound exposure is called the ***sound exposure level*** (SEL):

$$SEL = 10\log_{10}\left(\frac{\int_0^T p^2(t)\,dt}{P_{ref}^2 T_{ref}}\right). \tag{C-18}$$

If P_{ref} = 1 μPa and T_{ref} = 1 s, Eq. (C-18) is identical to Eq. C-12).

An expression analogous to Eq. (C-14) may also be developed for SEL, yielding

$$SEL = SPL + 10\log_{10}(T), \tag{C-19}$$

where T is in seconds.

Sound exposure and sound exposure level are often used in airborne applications. In these situations, $p(t)$ is normally replaced with the instantaneous A-weighted sound pressure and the reference pressure P_{ref} = 20 µPa (ANSI, 1994).

C.5 Sound Propagation

C.5.1 Reflection and Refraction

When a sound wave propagating in a medium encounters a second medium with a different density or sound speed, part of the incident sound will be ***reflected*** back into the first medium and part will be ***transmitted*** into the second medium. If the second medium has a different sound speed than the first, the propagation direction will change as the sound wave enters the second medium; this phenomenon is called ***refraction***. Refraction may also occur within a single medium if spatial gradients exist in the sound speed.

Refraction of sound resulting from spatial variations in the sound speed is one of the most important phenomena that affects sound propagation in water. The sound speed in the ocean primarily depends on hydrostatic pressure (i.e., depth) and temperature. Sound speed increases with both hydrostatic pressure and temperature. In seawater, temperature has the most important effect on sound speed for depths less than about 300 m. Below 1500 m, the hydrostatic pressure is the dominant factor because the water temperature is relatively constant. The variation of sound speed with depth in the ocean is called a sound speed profile. Although the actual variations in sound speed are small, the existence of sound speed gradients in the ocean has an enormous impact on the propagation of sound in the deep ocean.

C.5.2 Diffraction, Scattering, and Reverberation

Sound waves experience diffraction in much the same manner as light waves. ***Diffraction*** may be thought of as the bending of a sound wave around an obstacle. Common examples include sound heard from a source around the corner of a building and sound propagating through a small gap in an otherwise closed door or window.

An obstacle or inhomogeneity (for example, smoke, suspended particles, or gas bubbles) in the path of a sound wave causes ***scattering*** if secondary sound spreads out from it in a variety of directions (Pierce, 1989). Scattering is similar to diffraction. Normally *diffraction* is used to describe sound bending or scattering from a single object and *scattering* is used when there are multiple objects.

Reverberation refers to the prolongation of a sound that occurs when sound waves in an enclosed space are repeatedly reflected from the boundaries defining the space, even after the source has stopped emitting.

C.5.3 Sound Attenuation and Transmission Loss

As a sound wave passes through a medium, the intensity decreases with distance from the sound source. This phenomenon is known as attenuation or propagation loss. The effects of sound attenuation may be described using the ***transmission loss*** (*TL*), defined as

$$TL = 20\log_{10}\frac{P(1)}{P(r)}, \qquad \text{(C-20)}$$

where $P(1)$ is the sound pressure at a distance of 1 m from the source and $P(r)$ is the sound pressure at a distance r (Kinsler *et al*., 1982). The units of transmission loss are dB. The transmission loss is used to relate the ***source level*** (*SL*), defined as the *SPL* produced by a sound source at a distance of 1 m, and the ***received level*** (*RL*) at a particular location:

$$RL = SL - TL. \qquad \text{(C-21)}$$

The main contributors to sound attenuation are

- ***geometrical spreading*** or divergence of the sound wave as it propagates away from the source,
- ***sound absorption*** (conversion of sound energy into heat),
- ***scattering***, ***diffraction***, ***multipath interference***, ***boundary effects***, and other non-geometrical effects (Kinsler *et al*., 1982; Urick, 1983).

C.5.3.1 Spreading Loss

Spreading loss or divergence loss is a geometrical effect representing a regular weakening of a sound wave as it spreads out from a source (Urick, 1983). Spreading describes the reduction in sound pressure caused by the increase in surface area as the distance from a sound source increases. Spherical and cylindrical spreading are common types of spreading loss.

A point sound source in a homogeneous, lossless medium without boundaries will radiate spherical waves — the acoustic energy spreads out from the source in the form of a spherical shell. As the distance from the source increase, the shell surface area increases. If the sound power is fixed, the sound intensity must decrease with distance from the source (intensity is power per unit area). The surface area of a sphere is $4\pi r^2$, where r is the sphere radius, so the change in intensity is proportional to the radius squared. For spherical waves, $I = \overline{P}^2 / \rho c$, so the pressure decreases as the inverse of radial distance. This prediction is known as the ***spherical spreading law***. The transmission loss for spherical spreading is

$$TL = 20\log_{10} r \, , \tag{C-22}$$

where r is the distance from the source. This is equivalent to a 6 dB reduction in *SPL* for each doubling of distance from the sound source.

In ***cylindrical spreading***, spherical waves expanding from the source are constrained by upper and lower boundaries and take on a cylindrical shape. In this case the sound wave expands in the shape of a cylinder rather than a sphere and the transmission loss is

$$TL = 10\log_{10} r \, . \tag{C-23}$$

Cylindrical spreading is an approximation to wave propagation in a water-filled channel with horizontal dimensions much larger than the depth. Cylindrical spreading predicts a 3 dB reduction in *SPL* for each doubling of distance from the source.

C.5.3.2 Multipath Loss

Multipath refers to sound waves from a single source traveling multiple sound paths before reaching a single receiver. Multipath propagation is common when a source is located relatively close to a boundary and, in underwater applications, when the depth is small relative to the horizontal propagation distance. In multipath propagation, sound may not only travel a direct path from source to receiver, but also be reflected from the surface and/or bottom multiple times before reaching the receiver. The existence of multipaths results in a condition that permits constructive and destructive interference between sound waves propagating in the different paths and the received sound amplitude may be reduced as a result.

C.5.3.3 Surface and Bottom Effects

Because it reflects and scatters sound, the sea surface has a major effect on the propagation of underwater sound in applications where either the source or receiver is at shallow depth. If the sea surface is smooth, the reflected sound pressure is nearly equal to the incident sound pressure; however, if the sea surface is rough, the amplitude of the reflected sound wave will be reduced.

For a particular sound source, the relationship between the “direct” sound wave, which propagates directly from the source to the receiver, and the reflected wave depends on the depth of the source and the distance to the receiver. At some distances the reflected wave will be in-phase with the direct wave (their waveforms add together) and at other distances the two waves will be out-of-phase (their waveforms cancel). This results in constructive and destructive interference between the surface reflected sound wave and produces an interference pattern in the underwater sound field. This phenomenon is called the ***Lloyd mirror effect*** and is an example of multipath propagation loss. In this case the resulting sound field contains an alternating series of sound pressure maxima and minima.

The sea bottom is a reflecting and scattering surface, similar to the sea surface. Sound interaction with the sea bottom is more complex, however, primarily because the acoustic properties of the sea bottom are more variable and the bottom is often layered into regions of differing density and sound speed. The Lloyd mirror effect may also be observed from sound sources located near the sea bottom. For a “hard” bottom such as rock, the reflected wave will be approximately in-phase with the incident wave. Thus, near the ocean bottom, the incident and reflected sound pressures may add together, resulting in an increased sound pressure near the sea bottom.

C.6 References

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APPENDIX D

SUMMARY OF ACOUSTIC MODELING RESULTS

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D SUMMARY OF ACOUSTIC MODELING RESULTS

When analyzing the results of the acoustic effect modeling to provide an estimate of harassment, it is important to understand that there are limitations to the ecological data used in the model, and to interpret the model results within the context of a given species' ecology.

It is also important to understand that the estimates of marine mammal sound exposures are presented **without** consideration of mitigation. The Navy will work through the ESA consultation process to evaluate the mitigation measures to reduce the potential for incidental harassment to ESA-listed species (see Chapter 6). Based on the ongoing consultation and the consideration of mitigation with NMFS, the Navy would request authorization under MMPA and ESA for any listed species where NMFS concludes that incidental harassment may occur.

D.1 Summary of Modeling Results Published in 2008 for Site A off the Coast of Northeastern Florida

Table D-1 provides the Site A annual raw acoustic exposure estimates by source, Table D-2 provides the Site A effect estimate by training scenario, and Table D-3 provides the Site A effect estimate by mammal species.

D.2 Summary of Modeling Results Published in 2008 for Site B off the Coast of South Carolina

Table D-4 provides the Site B annual raw acoustic exposure estimates by source, Table D-5 provides the Site B effect estimate by training scenario, and Table D-6 provides the Site B effect estimate by mammal species.

D.3 Summary of Modeling Results Published in 2008 for Site C off the Coast of Southeastern North Carolina

Table D-7 provides the Site C annual raw acoustic exposure estimates by source, Table D-8 provides the Site C effect estimate by training scenario, and Table D-9 provides the Site C effect estimate by mammal species.

D.4 Summary of Modeling Results Published in 2008 for Site D off the Coast of Northeastern Virginia

Table D-10 provides the Site D annual raw acoustic exposure estimates by source, Table D-11 provides the Site D effect estimate by training scenario, and Table D-12 provides the Site D effect estimate by mammal species.

Table D-1

Site A - MMPA Harassment Estimate Summary by Source
Total annual number of estimated exposures of all species

Source	Estimated PTS Exposures (MMPA Level A)	Estimated TTS Exposures (MMPA Level B)	Estimated Behavioral Exposures (MMPA Level B)
SQS-56 Search Mode	0.0	6.1	12032.8
SQS-56 Target Mode	0.0	2.0	5978.5
SQS-53 Search Mode	4.8	1471.8	58976.7
SQS-53 Target Mode	0.0	7.2	13004.1
SUB	0.4	12.2	12168.4
Mk 48	0.0	4.2	391.7
ALFS	2.5	193.4	2490.0
DICASS	0.0	2.6	60.7
M k 46/54	0.0	0.7	0.4
ADC Mk 43	0.1	1.2	142.3
NIXIE	0.0	0.0	69.3

Table D-2

Site A - MMPA Harassment Summary by Scenario
Total annual number of estimated exposures of all species

	Scenario 1 Estimated MMPA Harassments	Scenario 2 Estimated MMPA Harassments	Scenario 3 Estimated MMPA Harassments	Scenario 4 Estimated MMPA Harassments
Estimated PTS Exposures (MMPA Level A)	2.1	2.8	0.4	2.5
Estimated TTS Exposures (MMPA Level B)	158.9	808.7	14.8	719.1
Estimated Behavioral Exposures (MMPA Level B)	2760.1	48216.1	12659.9	42766.5

Table D-3

Site A - MMPA Harassment Estimate Summary by Marine Mammal
Total annual number of estimated exposures of all species

Species	Estimated PTS Exposures (MMPA Level A)	Estimated TTS Exposures (MMPA Level B)	Estimated Behavioral Exposures (MMPA Level B)
Bottlenose Dolphin	4.3	747.4	49756.9
Pilot Whales	0.1	23.6	1809.5
Common Dolphin	0.0	0.0	0.0
Risso's Dolphin	0.2	28.8	2554.4
All Beaked Whales	0.0	0.0	28.2
Humpback Whales	0.0	1.8	105.6
Sperm Whales	0.0	0.0	0.0
Spotted Dolphins	2.8	808.2	46558.5
Clymene Dolphin	0.1	28.1	1713.1
Northern Right Whales	0.0	0.5	47.0
Pygmy Dwarf Sperm Whales	0.0	2.7	162.8
Rough Toothed Dolphin	0.0	1.3	77.4
Striped Dolphin	0.0	0.0	0.0
Minke Whale	0.0	0.1	7.4
Pantropical Dolphin	0.2	58.9	3585.8
Fin Whale	0.0	0.0	0.0
Sei Whale	0.0	0.0	0.0

Table D-4

Site B MMPA Harassment Estimate Summary by Source
Total annual number of estimated exposures of all species

Source	Estimated PTS Exposures (MMPA Level A)	Estimated TTS Exposures (MMPA Level B)	Estimated Behavioral Exposures (MMPA Level B)
SQS-56 Search Mode	0.0	0.7	2116.2
SQS-56 Target Mode	0.0	0.2*	1058.1**
SQS-53 Search Mode	0.0	170.9	3300.6
SQS-53 Target Mode	0.0	0.8	550.2
SUB	0.0	13.7	856.1
MK-48	0.0	0.7	240.1
ALFS	0.0	11.2	539.8
DICASS	0.0	0.3	56.3
Mk 46/54	0.0	0.0	0.1
ADC Mk43	0.1	0.4	0.2
NIXIE	0.0	0.0	18.6

Notes: * value equals 1/3 of estimated TTS exposures for SQS-56 search mode
** value equals 1/2 of estimated behavioral exposures for SQS-56 search mode

Table D-5

Site B - MMPA Harassment Summary by Scenario
Total annual number of estimated exposures of all species

	Scenario 1 Estimated MMPA Harassments	Scenario 2 Estimated MMPA Harassments	Scenario 3 Estimated MMPA Harassments	Scenario 4 Estimated MMPA Harassments
Estimated PTS Exposures (MMPA Level A)	0.0	0.0	0.0	0.0
Estimated TTS Exposures (MMPA Level B)	9.5	92.7	14.2	82.5
Estimated Behavioral Exposures (MMPA Level B)	789.7	3370.7	1096.8	2934.5

Table D-6

Site B - MMPA Harassment Estimate Summary by Marine Mammal
Total annual number of estimated exposures of all species

Species	Estimated PTS Exposures (MMPA Level A)	Estimated TTS Exposures (MMPA Level B)	Estimated Behavioral Exposures (MMPA Level B)
Bottlenose Dolphin	0.0	75.8	3298.1
Pilot Whales	0.0	15.4	748.9
Common Dolphin	0.0	0.0	0.0
Risso's Dolphin	0.0	18.6	756.0
All Beaked Whales	0.0	0.0	0.0
Humpback Whales	0.0	0.0	23.0
Sperm Whales	0.0	0.0	0.0
Spotted Dolphins	0.0	0.0	2405.1
Clymene Dolphin	0.0	0.0	296.9
Northern Right Whales	0.0	0.0	4.3
Pygmy Dwarf Sperm Whales	0.0	0.7	28.5
Rough Toothed Dolphin	0.0	0.0	12.5
Striped Dolphin	0.0	0.0	0.0
Minke Whale	0.0	0.0	1.1
Pantropical Dolphin	0.0	0.0	621.2
Fin Whale	0.0	0.0	0.0
Sei Whale	0.0	0.0	0.0

Table D-7

Site C - Acoustic Effect Analysis Output by Source
Total annual number of estimated exposures of all species

Source	Estimated PTS Exposures (MMPA Level A)	Estimated TTS Exposures (MMPA Level B)	Estimated Behavioral Exposures (MMPA Level B)
SQS-56 Search Mode	0.0	2.2	2273.6
SQS-56 Target Mode	0.0	0.7	1209.3
SQS-53 Search Mode	1.8	608.7	13600.1
SQS-53 Target Mode	0.0	2.6	2680.4
SUB	0.2	10.5	18025.6
MK-48	0.0	2.3	186.2
ALFS	0.0	17.3	3535.3
DICASS	0.0	0.9	105.6
MK 54	0.0	0.0	0.0
Mk 46	0.0	0.3	0.2
ADC Mk43	0.5	0.6	80.8
NIXIE	0.0	0.0	24.6

Table D-8

Site C - MMPA Harassment Summary by Scenario
Total annual number of estimated exposures of all species

	Scenario 1 Estimated MMPA Harassments	Scenario 2 Estimated MMPA Harassments	Scenario 3 Estimated MMPA Harassments	Scenario 4 Estimated MMPA Harassments
Estimated PTS Exposures (MMPA Level A)	0.0	0.9	0.2	0.8
Estimated TTS Exposures (MMPA Level B)	14.9	327.9	11.9	291.5
Estimated Behavioral Exposures (MMPA Level B)	3326.6	10993.4	18275.5	9724.8

Table D-9

Site C - MMPA Harassment Estimate Summary by Marine Mammal
Total annual number of estimated exposures of all species

Species	Estimated PTS Exposures (MMPA Level A)	Estimated TTS Exposures (MMPA Level B)	Estimated Behavioral Exposures (MMPA Level B)
Bottlenose Dolphin	0.9	239.8	21861.2
Pilot Whales	0.0	2.9	539.1
Common Dolphin	0.0	0.0	1.2
Risso's Dolphin	0.0	5.6	348.7
All Beaked Whales	0.0	0.0	3.1
Humpback Whales	0.0	0.0	0.0
Sperm Whales	0.0	0.0	0.0
Spotted Dolphins	0.8	304.3	14050.0
Clymene Dolphin	0.1	28.9	1704.1
Northern Right Whales	0.0	0.0	3.5
Pygmy Dwarf Sperm Whales	0.0	2.7	161.9
Rough Toothed Dolphin	0.0	1.3	76.9
Striped Dolphin	0.0	0.0	0.0
Minke Whale	0.0	0.1	7.6
Pantropical Dolphin	0.2	60.5	3567.0
Fin Whale	0.0	0.0	0.0
Sei Whale	0.0	0.0	0.0

Table D-10

Site D - Acoustic Effect Analysis Output by Source
Total annual number of estimated exposures of all species

Source	Estimated PTS Exposures (MMPA Level A)	Estimated TTS Exposures (MMPA Level B)	Estimated Behavioral Exposures (MMPA Level B)
SQS-56 Search Mode	0.0	11.0	11430.2
SQS-56 Target Mode	0.0	3.7	5702.2
SQS-53 Search Mode	9.4	3570.1	64215.7
SQS-53 Target Mode	0.0	14.1	9113.1
SUB	1.0	79.7	45124.3
MK-48	0.0	15.3	1317.7
ALFS	0.0	62.7	10512.7
DICASS	0.0	4.9	363.4
MK 54	0.0	0.0	0.0
Mk 46	0.0	1.2	1.0
ADC Mk43	0.2	2.0	230.9
NIXIE	0.0	0.0	108.3

Table D-11

Site D - MMPA Harassment Summary by Scenario
Total annual number of estimated exposures of all species

	Scenario 1 Estimated MMPA Harassments	Scenario 2 Estimated MMPA Harassments	Scenario 3 Estimated MMPA Harassments	Scenario 4 Estimated MMPA Harassments
Estimated PTS Exposures (MMPA Level A)	0.1	5.0	1.0	4.5
Estimated TTS Exposures (MMPA Level B)	55.2	1915.1	88.5	1702.1
Estimated Behavioral Exposures (MMPA Level B)	10617.9	49869.3	46526.6	44035.2

Table D-12

Site D - MMPA Harassment Estimate Summary by Marine Mammal
Total annual number of estimated exposures of all species

Species	Estimated PTS Exposures (MMPA Level A)	Estimated TTS Exposures (MMPA Level B)	Estimated Behavioral Exposures (MMPA Level B)
Bottlenose Dolphin	0.2	80.1	6640.1
Pilot Whales	0.1	31.3	3632.1
Common Dolphin	9.2	3329.0	119211.6
Risso's Dolphin	0.2	46.1	2243.3
All Beaked Whales	0.0	0.5	127.6
Humpback Whales	0.0	0.0	0.0
Sperm Whales	0.0	1.1	268.2
Spotted Dolphins	0.0	0.7	80.3
Clymene Dolphin	0.1	31.6	1421.2
Northern Right Whales	0.0	0.4	15.5
Pygmy Dwarf Sperm Whales	0.0	3.0	135.0
Rough Toothed Dolphin	0.0	1.4	64.2
Striped Dolphin	0.6	167.5	14148.4
Minke Whale	0.0	0.1	6.2
Pantropical Dolphin	0.2	66.2	2974.7
Fin Whale	0.0	1.8	84.6
Sei Whale	0.0	0.0	0.0

APPENDIX E

CETACEAN STRANDING REPORT

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E Cetacean Stranding Report

E.1 What is a Stranded Marine Mammal?

When a live or dead marine mammal swims or floats onto shore and becomes "beached" or incapable of returning to sea, the event is termed a "stranding" (Geraci et al., 1999; Perrin and Geraci, 2002; Geraci and Lounsbury, 2005; NMFS, 2007). The legal definition for a stranding within the United States is that " (A) a marine mammal is dead and is (i) on a beach or shore of the United States; or (ii) in waters under the jurisdiction of the United States (including any navigable waters); or (B) a marine mammal is alive and is (i) on a beach or shore of the United States and is unable to return to the water; (ii) on a beach or shore of the United States and, although able to return to the water, is in need of apparent medical attention; or (iii) in the waters under the jurisdiction of the United States (including any navigable waters), but is unable to return to its natural habitat under its own power or without assistance." (16 United States Code [U.S.C.] 1421h).

The majority of animals that strand are dead or moribund (NMFS, 2007). For those that are alive, human intervention through medical aid and/or guidance seaward may be required for the animal to return to the sea. If unable to return to sea, rehabilitation at an appropriate facility may be determined as the best opportunity for animal survival.

Three general categories can be used to describe strandings: single, mass, and unusual mortality events. The most frequent type of stranding is a single stranding, which involves only one animal (or a mother/calf pair) (NMFS, 2007).

Mass stranding involves two or more marine mammals of the same species other than a mother/calf pair (Wilkinson, 1991), and may span one or more days and range over several miles (Simmonds and Lopez-Jurado, 1991; Frantzis, 1998; Walsh et al., 2001; Freitas, 2004). In North America, only a few species typically strand in large groups of 15 or more and include sperm whales, pilot whales, false killer whales, Atlantic white-sided dolphins, white-beaked dolphins, and rough-toothed dolphins (Odell,1987, Walsh et al., 2001). Some species, such as pilot whales, false-killer whales, and melon-headed whales occasionally strand in groups of 50 to 150 or more (Geraci et al., 1999). All of these normally pelagic off-shore species are highly sociable and usually infrequently encountered in coastal waters. Species that commonly strand in smaller numbers include pygmy killer whales, common dolphins, bottlenose dolphins, Pacific white-sided dolphin Frasier's dolphins, gray whale and humpback whale (West Coast only), harbor porpoise, Cuvier's beaked whales, California sea lions, and harbor seals (Mazzuca et al., 1999, Norman et al., 2004, Geraci and Lounsbury, 2005).

Unusual mortality events (UMEs) can be a series of single strandings or mass strandings, or unexpected mortalities (i.e., die-offs) that occur under unusual circumstances (Dierauf and Gulland, 2001; Harwood, 2002; Gulland, 2006; NMFS, 2007). These events may be interrelated:

for instance, at-sea die-offs lead to increased stranding frequency over a short period of time, generally within one to two months. As published by the NMFS, revised criteria for defining a UME include (Hohn et al., 2006b):

(1) A marked increase in the magnitude or a marked change in the nature of morbidity, mortality, or strandings when compared with prior records.

(2) A temporal change in morbidity, mortality, or strandings is occurring.

(3) A spatial change in morbidity, mortality, or strandings is occurring.

(4) The species, age, or sex composition of the affected animals is different than that of animals that are normally affected.

(5) Affected animals exhibit similar or unusual pathologic findings, behavior patterns, clinical signs, or general physical condition (e.g., blubber thickness).

(6) Potentially significant morbidity, mortality, or stranding is observed in species, stocks or populations that are particularly vulnerable (e.g., listed as depleted, threatened or endangered or declining). For example, stranding of three or four right whales may be cause for great concern whereas stranding of a similar number of fin whales may not.

(7) Morbidity is observed concurrent with or as part of an unexplained continual decline of a marine mammal population, stock, or species.

Unusual environmental conditions are probably responsible for most UMEs and marine mammal die-offs (Vidal and Gallo-Reynoso, 1996; Geraci et al., 1999; Walsh et al., 2001; Gulland and Hall, 2005). Table E-1 provides an overview of documented UMEs attributable to natural causes over the past four decades worldwide.

E.2 United States Stranding Response Organization

Stranding events provide scientists and resource managers information not available from limited at-sea surveys, and may be the only way to learn key biological information about certain species such as distribution, seasonal occurrence, and health (Rankin, 1953; Moore et al., 2004; Geraci and Lounsbury, 2005). Necropsies are useful in attempting to determine a reason for the stranding, and are performed on stranded animals when the situation and resources allow.

Table E-1

Marine Mammal Unusual Mortality Events Attributed to or Suspected from Natural Causes 1978-2005

Year	Species and number	Location	Cause
1978	Hawaiian monk seals (50)	NW Hawaiian Islands	Ciguatoxin and maitotoxin
1979-80	Harbor seals (400)	Massachusetts	Influenza A
1982	Harbor seals	Massachusetts	Influenza A
1983	Multiple pinniped species	West coast of US, Galapagos	El Nino
1984	California sea lions (226)	California	Leptospirosis
1987	Sea otters (34)	Alaska	Saxitoxin
1987	Humpback whales (14)	Massachusetts	Saxitoxin
1987-88	Bottlenose dolphins (645)	Eastern seaboard (New Jersey to Florida)	Morbillivirus; Brevetoxin
1987-88	Baikal seals (80-100,000)	Lake Baikal, Russia	Canine distemper virus
1988	Harbor seals (approx 18,000)	Northern Europe	Phocine distemper virus
1990	Striped dolphins (550)	Mediterranean Sea	Dolphin morbillivirus
1990	Bottlenose dolphins (146)	Gulf Coast, US	Unknown; unusual skin lesions observed
1994	Bottlenose dolphins (72)	Texas	Morbillivirus
1995	California sea lions (222)	California	Leptospirosis
1996	Florida manatees (149)	West Coast Florida	Brevetoxin
1996	Bottlenose dolphins (30)	Mississippi	Unknown; Coincident with algal bloom
1997	Mediterranean monk seals (150)	Western Sahara, Africa	Harmful algal bloom; Morbillivirus
1997-98	California sea lions (100s)	California	El Nino
1998	California sea lions (70)	California	Domoic acid
1998	Hooker’s sea lions (60% of pups)	New Zealand	Unknown, bacteria likely
1999	Harbor porpoises	Maine to North Carolina	Oceanographic factors suggested
2000	Caspian seals (10,000)	Caspian Sea	Canine distemper virus
1999-2000	Bottlenose dolphins (115)	Panhandle of Florida	Brevetoxin
1999-2001	Gray whales (651)	Canada, US West Coast, Mexico	Unknown; starvation involved
2000	California sea lions (178)	California	Leptospirosis
2000	California sea lions (184)	California	Domoic acid
2000	Harbor seals (26)	California	Unknown; Viral pneumonia suspected
2001	Bottlenose dolphins (35)	Florida	Unknown
2001	Harp seals (453)	Maine to Massachusetts	Unknown
2001	Hawaiian monk seals (11)	NW Hawaiian Islands	Malnutrition

Table E-1 (cont'd)

Marine Mammal Unusual Mortality Events Attributed to or Suspected from Natural Causes 1978-2005

Year	Species and number	Location	Cause
2002	Harbor seals (approx. 25,000)	Northern Europe	Phocine distemper virus
2002	Multispecies (common dolphins, California sea lions, sea otters) (approx. 500)	California	Domoic acid
2002	Hooker's sea lions	New Zealand	Pneumonia
2002	Florida manatee	West Coast of Florida	Brevetoxin
2003	Multispecies (common dolphins, California sea lions, sea otters) (approx. 500)	California	Domoic acid
2003	Beluga whales (20)	Alaska	Ecological factors
2003	Sea otters	California	Ecological factors
2003	Large whales (16 humpback, 1 fine, 1 minke, 1 pilot, 2 unknown)	Maine	Unknown; Saxitoxin and domoic acid detected in 2 of 3 humpbacks
2003-2004	Harbor seals, minke whales	Gulf of Maine	Unknown
2003	Florida manatees (96)	West Coast of Florida	Brevetoxin
2004	Bottlenose dolphins (107)	Florida Panhandle	Brevetoxin
2004	Small cetaceans (67)	Virginia	Unknown
2004	Small cetaceans	North Carolina	Unknown
2004	California sea lions (405)	Canada, US West Coast	Leptospirosis
2003	Florida manatees (96)	West Coast of Florida	Brevetoxin
2005	Florida manatees, bottlenose dolphins (ongoing Dec 2005)	West Coast of Florida	Brevetoxin
2005	Harbor porpoises	North Carolina	Unknown
2005	California sea lions; Northern fur seals	California	Domoic acid
2005	Large whales	Eastern North Atlantic	Domoic acid suspected
2005-2006	Bottlenose dolphins	Florida	Brevetoxin suspected
Note: Data from Gulland and Hall (2007): citations for each event contained in Gulland and Hall (2007).			

In 1992, Congress passed the Marine Mammal Health and Stranding Response Act (MMHSRA) which authorized the Marine Mammal Health and Stranding Response Program (MMHSRP) under authority of the Department of Commerce, National Marine Fisheries Service. The MMHSRP was created because of public concern over marine mammal mortalities. Its objectives are twofold: to formalize the response process and to focus efforts being initiated by numerous local stranding organizations.

Major elements of the MMHSRP include the following (NMFS, 2007):

- National Marine Mammal Stranding Network
- Marine Mammal UME Program
- National Marine Mammal Tissue Bank (NMMTB) and Quality Assurance Program
- Marine Mammal Health Biomonitoring, Research, and Development
- Marine Mammal Disentanglement Network
- John H. Prescott Marine Mammal Rescue Assistance Grant Program (a.k.a. the Prescott Grant Program)
- Information Management and Dissemination.

The United States has a well-organized network in coastal states to respond to marine mammal strandings. Overseen by the NMFS, the National Marine Mammal Stranding Network is comprised of smaller organizations manned by professionals and volunteers from nonprofit organizations, aquaria, universities, and state and local governments trained in stranding response. Through a National Coordinator and six regional coordinators, NMFS authorizes and oversees stranding response activities and provides specialized training for the network.

The following is a list of NMFS Regions and Associated States and Territories:

- NMFS Northeast Region- ME, NH, MA, RI, CT, NY, NJ, PA, DE, MD, VA
- NMFS Southeast Region- NC, SC, GA, FL, AL, MS, LA, TX, PR, VI
- NMFS Southwest Region- CA
- NMFS Northwest Region- OR, WA
- NMFS Alaska Region- AK
- NMFS Pacific Islands Region- HI, Guam, American Samoa, Commonwealth of the Northern Mariana Islands (CNMI)

Stranding reporting and response efforts over time have been inconsistent, although effort and data quality within the United States have been improving within the last 20 years (NMFS, 2007). Given the historical inconsistency in response and reporting, however, interpretation of long-term trends in marine mammal stranding is difficult (NMFS, 2007). Nationwide, from 1995-2004, there were approximately 700-1500 cetacean strandings per year and between 2000-4600 pinniped strandings per year (NMFS, 2007). Detailed regional stranding information including most commonly stranded species can be found in Zimmerman (1991), Geraci and Lounsbury (2005), and NMFS (2007).

E.3 Threats to Marine Mammals and Potential Causes for Stranding

Like any wildlife population, there are normal background mortality rates that influence marine mammal population dynamics, including starvation, predation, aging, reproductive success, and disease (Geraci et al., 1999; Carretta et al., 2007). Strandings may be reflective of this natural cycle or, more recently, may be the result of anthropogenic sources (i.e., human impacts). Current science suggests that multiple factors, both natural and man-made, may be acting alone or in combination to cause a marine mammal to strand (Geraci et al., 1999; Culik, 2002; Perrin and Geraci, 2002; Hoelzel, 2003; Geraci and Lounsbury, 2005; NRC, 2006). While post-stranding data collection and necropsies of dead animals are attempted in an effort to find a possible cause for the stranding, it is often difficult to pinpoint exactly one factor that is responsible for any given stranding. An animal suffering from one ailment becomes susceptible to various other influences because of its weakened condition, making it difficult to determine a primary cause. In many stranding cases, scientists never learn the exact reason for the stranding.

Specific threats and potential stranding causes may include the following:

- Natural causes
  - Disease
  - Natural toxins
  - Weather and climatic influences
  - Navigation errors
  - Social cohesion
  - Predation

- Anthropogenic (human influenced) causes
  - Fisheries interaction
  - Vessel strike
  - Pollution and ingestion
  - Noise

E.3.1 Natural Threats/Stranding Causes

E.3.1.1 Overview

Significant natural causes of mortality, die-offs, and stranding discussed below include disease and parasitism; marine neurotoxins from algae; navigation errors that lead to inadvertent stranding; and climatic influences that impact the distribution and abundance of potential food resources (i.e., starvation). Other natural mortality not discussed in detail includes predation by other species such as sharks (Cockcroft et al., 1989; Heithaus, 2001), killer whales (Constantine et al., 1998; Guinet et al., 2000; Pitman et al., 2001), and some species of pinniped (Hiruki et al., 1999; Robinson et al., 1999).

E.3.1.2 Disease

Like other mammals, marine mammals frequently suffer from a variety of diseases of viral, bacterial, and fungal origin (Visser et al., 1991; Dunn et al., 2001; Harwood, 2002). Gulland and Hall (2005; 2007) provide a more detailed summary of individual and population effects of marine mammal diseases.

Microparasites such as bacteria, viruses, and other microorganisms are commonly found in marine mammal habitats and usually pose little threat to a healthy animal (Geraci et al., 1999). For example, long-finned pilot whales that inhabit the waters off of the northeastern coast of the United States are carriers of the morbillivirus, yet have grown resistant to its usually lethal effects (Geraci et al., 1999). Since the 1980s, however, virus infections have been strongly associated with marine mammal die-offs (Domingo et al., 1992; Geraci and Lounsbury, 2005). Morbillivirus is the most significant identified marine mammal virus and suppresses a host's immune system and increases risk of secondary infection (Harwood, 2002). The largest bottlenose dolphin die-off associated with morbillivirus occurred in 1987, when hundreds of coastal dolphins succumbed to the virus (Lipscomb et al., 1994). A bottlenose dolphin UME in 1993 and 1994 was caused by morbillivirus. Die-offs ranged from northwestern Florida to Texas, with an increased number of deaths as it spread (NMFS, 2007). A 2004 UME in Florida was also associated with dolphin morbillivirus (NMFS, 2004). Influenza A was responsible for the first reported mass mortality in the U.S., occurring along the coast of New England in 1979-1980 (Geraci et al., 1999; Harwood, 2002). Canine distemper virus has been responsible for large scale pinniped mortalities and die-offs (Grachev et al., 1989; Kennedy et al., 2000; Gulland and Hall, 2005), while a bacteria, *Leptospira pomona*, is responsible for periodic die-offs in California sea lions about every four years (Gulland et al., 1996; Gulland and Hall, 2005). It is difficult to determine whether microparasites commonly act as a primary pathogen, or whether they show up as a secondary infection in an already weakened animal (Geraci et al., 1999). Most marine mammal die-offs from infectious disease in the last 25 years, however, have had viruses associated with them (Simmonds and Mayer, 1997; Geraci et al., 1999; Harwood, 2002).

Macroparasites are usually large parasitic organisms and include lungworms, trematodes (parasitic flatworms), and protozoans (Geraci and St.Aubin, 1987; Geraci et al., 1999). Marine mammals can carry many different types, and have shown a robust tolerance for sizeable infestation unless compromised by illness, injury, or starvation (Morimitsu et al., 1987; Dailey et al., 1991; Geraci et al., 1999). *Nasitrema spp.*, a usually benign trematode found in the head sinuses of cetaceans (Geraci et al., 1999), can cause brain damage if it migrates (Ridgway and Dailey, 1972). As a result, this worm is one of the few directly linked to stranding in the cetaceans (Dailey and Walker, 1978; Geraci et al., 1999).

Non-infectious disease, such as congenital bone pathology of the vertebral column (osteomyelitis, spondylosis deformans, and ankylosing spondylitis), has been described in several species of cetacean (Paterson, 1984; Alexander et al., 1989; Kompanje, 1995; Sweeny et al., 2005). In humans, bone pathology such as ankylosing spondylitis, can impair mobility and increase vulnerability to further spinal trauma (Resnick and Niwayama, 2002). Bone pathology has been found in cases of single strandings (Paterson, 1984; Kompanje, 1995), and also in cetaceans prone to mass stranding (Sweeny et al., 2005), possibly acting as a contributing or causal influence in both types of events.

E.3.1.3 Naturally Occurring Marine Neurotoxins

Some single cell marine algae common in coastal waters, such as dinoflagellates and diatoms, produce toxic compounds that can accumulate (termed bioaccumulation) in the flesh and organs of fish and invertebrates (Geraci et al., 1999; Harwood, 2002). Marine mammals become exposed to these compounds when they eat prey contaminated by these naturally produced toxins, (Van Dolah, 2005). Figure E-1 shows U.S. animal mortalities from 1997-2006 resulting from toxins produced during harmful algal blooms.

Figure E-1

Animal Mortalities from harmful algal blooms within the United States from 1997-2006.
(Source: Woods Hole Oceanographic Institute (WHO)
http://www.whoi.edu/redtide/HABdistribution/HABmap.html)

In the Gulf of Mexico and mid- to southern Atlantic states, "red tides," a form of harmful algal bloom, are created by a dinoflagellate (*Karenia brevis*). *K. brevis* is found throughout the Gulf of Mexico and sometimes along the Atlantic coast (Van Dolah, 2005; NMFS, 2007; Goldstein et al. 2008)). It produces a neurotoxin known as brevetoxin. Brevetoxin has been associated with several marine mammal UMEs within this area (Geraci, 1989; Van Dolah et al., 2003; NMFS, 2004; Flewelling et al., 2005; Van Dolah, 2005; NMFS, 2007). On the U.S. West Coast and in the northeast Atlantic, several species of diatoms produce a toxin called domoic acid which has also been linked to marine mammal strandings (Geraci et al., 1999; Van Dolah et al., 2003; Greig et al., 2005; Van Dolah, 2005; Brodie et al., 2006; NMFS, 2007). Other algal toxins associated with marine mammal strandings include saxitoxins and ciguatoxins and are summarized by Van Dolah (2005).

E.3.1.4 Weather Events and Climate Influences

Severe storms, hurricanes, typhoons, and prolonged temperature extremes may lead to localized marine mammal strandings (Geraci et al., 1999; Walsh et al., 2001). Hurricanes may have been responsible for mass strandings of pygmy killer whales in the British Virgin Islands and Gervais' beaked whales in North Carolina (Mignucci-Giannoni et al., 2000; Norman and Mead, 2001). Storms in 1982-1983 along the California coast led to deaths of 2,000 northern elephant seal pups (Le Boeuf and Reiter, 1991). Ice movement along southern Newfoundland has forced groups of blue whales and white-beaked dolphins ashore (Sergeant, 1982). Seasonal oceanographic conditions in terms of weather, frontal systems, and local currents may also play a role in stranding (Walker et al., 2005).

The effect of large scale climatic changes to the world's oceans and how these changes impact marine mammals and influence strandings is difficult to quantify given the broad spatial and temporal scales involved, and the cryptic movement patterns of marine mammals (Moore, 2005; Learmonth et al., 2006). The most immediate, although indirect, effect is decreased prey availability during unusual conditions. This, in turn, results in increased search effort required by marine mammals (Crocker et al., 2006) and potential starvation if foraging is not successful. Stranding may follow either as a direct result of starvation or as an indirect result of a weakened and stressed state (e.g., succumbing to disease) (Selzer and Payne, 1988; Geraci et al., 1999; Moore, 2005; Learmonth et al., 2006; Weise et al., 2006).

Two recent papers examined potential influences of climate fluctuation on stranding events in southern Australia, including Tasmania, an area with a history of more than 20 mass strandings since the 1920s (Evans et al., 2005; Bradshaw et al., 2006). These authors note that patterns in animal migration, survival, fecundity, population size, and strandings will revolve around the availability and distribution of food resources. In southern Australia, movement of nutrient-rich waters pushed closer to shore by periodic meridional winds (occurring about every 12 to 14 years) may be responsible for bringing marine mammals closer to land, thus increasing the probability of stranding (Bradshaw et al., 2006). The papers conclude, however, that while an overarching model can be helpful for providing insight into the prediction of strandings, the particular reasons for each one are likely to be quite varied.

E.3.1.5 Navigational Error

Geomagnetism- It has been hypothesized that, like some land animals, marine mammals may be able to orient to the Earth's magnetic field as a navigational cue, and that areas of local magnetic anomalies may influence strandings (Bauer et al., 1985; Klinowska, 1985; Kirschvink et al., 1986; Klinowska, 1986; Walker et al., 1992; Wartzok and Ketten, 1999). In a plot of live stranding positions in Great Britain with magnetic field maps, Klinowska (1985, 1986) observed an association between live stranding positions and magnetic field levels. In all cases, live strandings occurred at locations where magnetic minima, or lows in the magnetic fields, intersect the coastline. Kirschvink et al. (1986) plotted stranding locations on a map of magnetic data for the East Coast of the U.S., and were able to develop associations between stranding sites and locations where magnetic minima intersected the coast. The authors concluded that there were highly significant tendencies for cetaceans to beach themselves near these magnetic minima and coastal intersections. The results supported the hypothesis that cetaceans may have a magnetic sensory system similar to other migratory animals, and that marine magnetic topography and patterns may influence long-distance movements (Kirschvink et al., 1986). Walker et al. (1992) examined fin whale swim patterns off the northeastern U.S. continental shelf, and reported that migrating animals aligned with lows in the gradient of magnetic intensity. While a similar pattern between magnetic features and marine mammal strandings at New Zealand stranding sites was not seen (Brabyn and Frew, 1994), mass strandings in Hawaii typically were found to occur within a narrow range of magnetic anomalies (Mazzuca et al., 1999).

Echolocation Disruption in Shallow Water- Some researchers believe stranding may result from reductions in the effectiveness of echolocation within shallow water, especially with the pelagic species of odontocetes who may be less familiar with coastline (Dudok van Heel, 1966; Chambers and James, 2005). For an odontocete, echoes from echolocation signals contain important information on the location and identity of underwater objects and the shoreline. The authors postulate that the gradual slope of a beach may present difficulties to the navigational systems of some cetaceans, since it is common for live strandings to occur along beaches with shallow, sandy gradients (Brabyn and McLean, 1992; Mazzuca et al., 1999; Maldini et al., 2005; Walker et al., 2005). A contributing factor to echolocation interference in turbulent, shallow water is the presence of microbubbles from the interaction of wind, breaking waves, and currents. Additionally, ocean water near the shoreline can have an increased turbidity (e.g., floating sand or silt, particulate plant matter, etc.) due to the run-off of fresh water into the ocean, either from rainfall or from freshwater outflows (e.g., rivers and creeks). Collectively, these factors can reduce and scatter the sound energy within echolocation signals and reduce the perceptibility of returning echoes of interest.

E.3.1.6 Social cohesion

Many pelagic species such as sperm whales, pilot whales, melon-head whales, and false killer whales, and some dolphins occur in large groups with strong social bonds between individuals. When one or more animals strand due to any number of causative events, then the entire pod may follow suit out of social cohesion (Geraci et al., 1999; Conner, 2000; Perrin and Geraci, 2002; NMFS, 2007).

E.3.2 Anthropogenic Threats/Stranding causes

E.3.2.1 Overview

With the exception of historic whaling in the 19th and early part of the 20th century, during the past few decades there has been an increase in marine mammal mortalities associated with a variety of human activities (Geraci et al., 1999; NMFS, 2007). These include fisheries interactions (bycatch and directed catch), pollution (marine debris, toxic compounds), habitat modification (degradation, prey reduction), vessel strikes (Laist et al., 2001), and gunshots. Figure E-2 shows potential worldwide risk to small-toothed cetaceans by source.

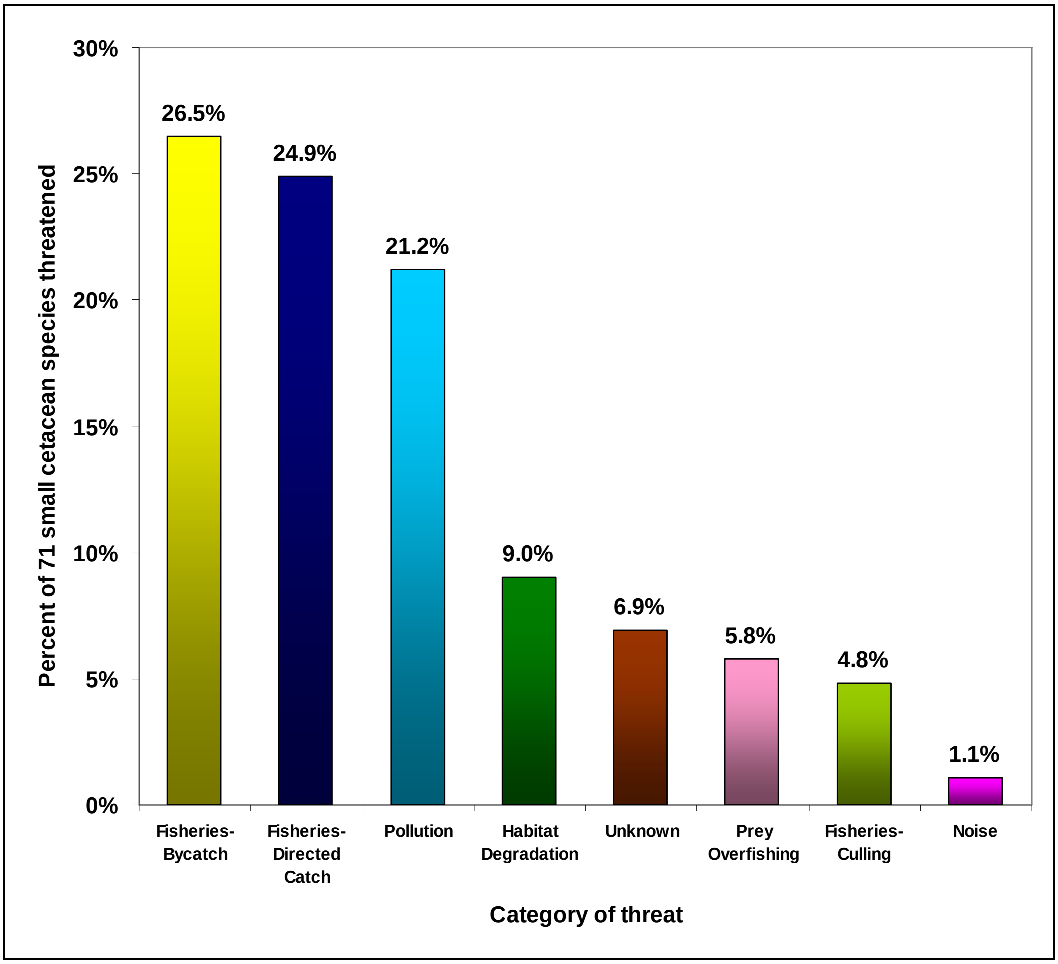

Figure E-2

Human threats to world wide small cetacean populations.
(Source: Culik 2002)

E.3.2.2 Fisheries Interaction: By-Catch and Entanglement

The incidental catch of marine mammals in commercial fisheries is a significant threat to the survival and recovery of many populations of marine mammals (Geraci et al., 1999; Baird, 2002; Culik, 2002; Carretta et al., 2004; Geraci and Lounsbury, 2005; NMFS, 2007). Interactions with fisheries and entanglement in discarded or lost gear continue to be a major factor in their deaths worldwide (Geraci et al., 1999; Nieri et al., 1999; Geraci and Lounsbury, 2005; Read et al., 2006; Zeeber et al., 2006).

By-catch- By-catch is the catching of non-target species within a given fishing operation and can include non-commercially used invertebrates, fish, sea turtles, birds, and marine mammals (NRC, 2006). Read et al. (2006) estimated the magnitude of marine mammal by-catch in U.S. and global fisheries. Data for the United States was obtained from fisheries observer programs, reports of entangled stranded animals, and fishery logbooks. In U.S. fisheries, the mean annual by-catch of marine mammals between 1990 and 1999 was 6,215 animals (SE = +/- 448). Eighty-four percent of cetacean by-catch occurred in gill-net fisheries, with dolphins and porpoises constituting the majority of these. The authors noted a 40 percent decline in marine mammal by-catch in the years 1995 through 1999 compared to 1990 through 1994, and suggested that effective conservation measures implemented during the later time period played a significant role.

To estimate annual global by-catch, Read et al. (2006) used U.S. vessel by-catch data from 1990-1994 and extrapolated to the world's vessels for the same time period. They calculated an estimate of 653,365 of marine mammals caught annually around the world, again with most occurring in gill-net fisheries. The authors concluded that with global marine mammal by-catch likely to be in the hundreds of thousands every year, by-catch in fisheries will be the single greatest threat to many marine mammal populations around the world.

Entanglement- Active and discarded fishing gear pose a major threat to marine mammals. Entanglement can lead to drowning and/or impairment in activities such as diving, swimming, feeding and breeding. Stranded marine mammals frequently exhibit signs of previous fishery interaction, such as scarring or gear still attached to their bodies, and the cause of death for many stranded marine mammals is often attributed to such interactions (Baird and Gorgone, 2005; Geraci et al., 1999; Campagna et al., 2007). Because marine mammals that die or are injured in fisheries may not wash ashore and not all animals that do wash ashore exhibit clear signs of interactions, stranding data probably underestimate fishery-related mortality and serious injury (NMFS, 2005a).

Various accounts of fishery-related stranding deaths have been reported over the last several decades along the U.S. coast. From 1993 through 2003, 1,105 harbor porpoises were reported stranded from Maine to North Carolina, many of which had cuts and body damage suggestive of net entanglement (NMFS, 2005d). In 1999, it was possible to determine that the cause of death for 38 of the stranded porpoises was from fishery interactions (NMFS, 2005d). An estimated 78 baleen whales were killed annually in the offshore southern California/Oregon drift gillnet fishery during the 1980s (Heyning and Lewis 1990). From 1998-2005, based on observer records, five fin whales (CA/OR/WA stock), 12 humpback whales (ENP stock), and six sperm whales (CA/OR/WA stock) were either seriously injured or killed in fisheries off the mainland U.S. West Coast (California Marine Mammal Stranding Network Database 2006).

E.3.2.3 Ship Strike

Marine mammals sometimes come into physical contact with oceangoing vessels, which can lead to injury or death and cause subsequent stranding (Laist et al. 2001; Geraci and Lounsbury, 2005; de Stephanis and Urquiola, 2006). These events, termed "ship strikes," occur when an animal at the surface is struck directly by a vessel, when a surfacing animal hits the bottom of a vessel, or when an animal just below the surface is cut by a vessel's propeller. The severity of injuries typically depends on the size and speed of the vessel (Knowlton and Kraus, 2001; Laist et al., 2001; Vanderlaan and Taggart 2007).

The growth in civilian commercial ports has been accompanied by a large increase in commercial vessel traffic. This has, in turn, expanded the threat of ship strikes to marine mammals in recent decades. The Final Report of the NOAA International Symposium on "Shipping Noise and Marine Mammals: A Forum for Science, Management, and Technology" stated that the worldwide commercial fleet has grown from approximately 30,000 vessels in 1950 to over 85,000 vessels in 1998 (NRC, 2003; Southall, 2005). From 1985 to 1999, world seaborne trade doubled to 5 billion tons and currently includes 90 percent of the total world trade, with container shipping movements representing the largest volume of seaborne trade. Current statistics support the prediction that the international shipping fleet will continue to grow at current or greater rates. Vessel densities along existing coastal routes are expected to increase both domestically and internationally. New routes are expected to develop as new ports are opened and existing ports are expanded. Vessel propulsion systems are also advancing toward faster ships operating in higher sea states for lower operating costs; and container ships are expected to become larger along certain routes (Southall, 2005). Given the expected increase in vessel density and operational capability, a concomitant increase in marine mammal ship strikes can be expected.

E.3.2.4 Ingestion of Marine Debris and Exposure to Toxins

Debris in the marine environment poses a health hazard for marine mammals. Not only can they become entangled, but animals may ingest plastics and other debris that are indigestible, and which can contribute to illness or death through irritation or blockage of the stomach and intestines (Tarpley and Marwitz, 1993, Whitaker et al., 1994; Gorzelany, 1998; Secchi and Zarzur, 1999; Baird and Hooker, 2000). There are certain species of cetaceans (e.g. sperm whales) that are more likely to eat trash, especially plastics (Geraci et al., 1999; Evans et al., 2003; Whitehead, 2003).

For example, between 1990 and October 1998, 215 pygmy sperm whales stranded along the U.S. Atlantic coast from New York through the Florida Keys (NMFS, 2005a). Remains of plastic bags and other debris were found in the stomachs of 13 of these animals. In 1987, a pair of latex examination gloves was retrieved from the stomach of a stranded dwarf sperm whale (NMFS, 2005c). In one pygmy sperm whale found stranded in 2002, red plastic debris was found in the stomach along with squid beaks (NMFS, 2005a). Oliveira de Meirelles and Barros (2007) documented mortality to a rough-toothed dolphin in Brazil from plastic debris ingestion.

Chemical contaminants like organochlorines (PCBs, DDT) and heavy metals may pose potential health risks to marine mammals (Das et al., 2003; De Guise et al., 2003).Despite having been banned for decades, levels of organochlorines are still high in marine mammal tissue samples taken along U.S. coasts (Hickie et al. 2007; Krahn et al. 2007; NMFS, 2007a). These compounds are long-lasting, reside in marine mammal adipose tissues (especially in the blubber), and can be toxic. Contaminant levels in odontocetes (piscivorous animals) have been reported to be one to two orders of magnitude higher compared to mysticetes (planktivorous animals) (Borell, 1993; O'Shea and Brownell, 1994; O'Hara and Rice, 1996; O'Hara et al., 1999).

Chronic exposure to PCBs and/or DDT is immunosuppressive, as has been seen in bottlenose dolphins (Lahvis et al., 1995) and seals (p. vitulina) (Ross et al., 1996). Chronic exposure has been linked to infectious disease mortality in harbor porpoises stranded in the UK (Jepson et al., 1999; Jepson et al., 2005), carcinoma in California in sea lions (Ylitalo et al., 2005), and population reductions of Baltic seals (Bergman et al., 2001). High levels of PCBs in immature, pelagic dolphins has been observed (Struntz et al., 2004), raising concern about contaminant loads further offshore. Moderate levels of PCBs and chlorinated pesticides (such as DDT, DDE, and dieldrin) have been found in pilot whale blubber with bioaccumulation levels more similar in whales from the same stranding event than from animals of the same age or sex (NMFS, 2005b). Accumulation of heavy metals has also been documented in many cetaceans (Frodello and Marchand, 2001; Das et al., 2003; Wittnich et al., 2004), sometimes exceeding levels known to cause neurologic and immune system impairment in other mammals (Nielsen et al., 2000; Das et al., 2003; De Guise et al., 2003).

Other forms of habitat contamination and degradation may also play a role in marine mammal mortality and strandings. Some events caused by humans have direct and obvious effects on marine mammals, such as oil spills (Geraci et al., 1999). Oil spills can cause both short- and long-term medical problems for many marine mammal species through ingestion of tainted prey, coating of skin/fur, and adherence to oral and nasal cavities (Moeller, 2003). In most cases, the effects of contamination are likely to be indirect in nature; e.g. effects on prey species availability or an increase in disease susceptibility (Geraci et al., 1999).

E.3.2.5 Anthropogenic Sound

There is evidence that underwater man-made sounds, such as explosions, drilling, construction, and certain types of sonar (Southall et al., 2006), may be a contributing factor in some stranding events. Marine mammals may respond both behaviorally and physiologically to anthropogenic sound exposure, (e.g., Richardson et al., 1995; Finneran et al., 2000; Finneran et al., 2003; Finneran et al., 2005); however, the range and magnitude of the behavioral response of marine mammals to various sound sources is highly variable (Richardson et al., 1995) and appears to depend on the species involved, the experience of the animal with the sound source, the motivation of the animal (e.g., feeding, mating), and the context of the exposure.

Exposure to sonar signals has been postulated as being a specific cause of several stranding events. Given that it is likely that the frequency of certain sonar systems is within the range of hearing of many marine mammals, the consideration of sonar as a causative mechanism of stranding is warranted. In the following sections, specific stranding events that have been putatively linked to sonar operations are discussed.

E.4 Stranding Event Case Studies

Over the past two decades, several mass stranding events involving beaked whales have been documented. A review of historical data (mostly anecdotal) maintained by the Marine Mammal Program in the National Museum of Natural History, Smithsonian Institution reports 49 beaked whale mass stranding events between 1838 and 1999. The largest beaked whale mass stranding occurred in the 1870s in New Zealand when 28 Gray's beaked whales (*Mesoplodon grayi*) stranded. Blainsville's beaked whale (*Mesoplodon densirostris*) strandings are rare, and records show that they were involved in one mass stranding in 1989 in the Canary Islands. Cuvier's beaked whales (*Ziphius cavirostris*) are the most frequently reported beaked whale to strand, with at least 19 stranding events from 1804 through 2000 (DoC and DoN, 2001; Smithsonian Institution, 2000). While beaked whale strandings have occurred since the 1800s (Geraci and Lounsbury, 1993; Cox et al., 2006; Podesta et al., 2006), several mass strandings have been temporally and spatially associated with naval operations utilizing mid-frequency active (MFA) sonar (Simmonds and Lopez-Jurado, 1991; Frantzis, 1998; Jepson et al., 2003; Cox et al., 2006).

E.4.1 Beaked Whale Case Studies

In the following sections, specific stranding events that have been putatively linked to potential sonar operations are discussed. These events represent a small overall number of animals over an 11 year period (40 animals) and not all worldwide beaked whale strandings can be linked to naval activity (ICES, 2005a; 2005b; Podesta et al., 2006). Four of the five events occurred during NATO exercises or events where DON presence was limited (Greece, Portugal, and Spain). One of the five events involved only DON ships (Bahamas). These events are given specific consideration in the case studies that follow.

Beaked whale stranding events associated with naval operations.

1996	May	Greece (NATO/US)
2000	March	Bahamas (US)
2000	May	Portugal, Madeira Islands (NATO/US)
2002	September	Spain, Canary Islands (NATO/US)
2006	January	Spain, Mediterranean Sea coast (NATO/US)

1996 Greece Beaked Whale Mass Stranding (May 12 – 13, 1996)

Description: Twelve Cuvier's beaked whales (*Ziphius cavirostris*) stranded along a 38.2-km (20.6-NM) strand of the coast of the Kyparissiakos Gulf on May 12 and 13, 1996 (Frantzis, 1998). From May 11 through May 15, the NATO research vessel Alliance was conducting sonar tests with signals of 600 Hz and 3 kHz and root-mean-squared (rms) sound pressure levels (SPL) of 228 and 226 dB re: 1 µPa, respectively (D'Amico and Verboom, 1998; D'Spain et al., 2006). The timing and the location of the testing encompassed the time and location of the whale strandings (Frantzis, 1998).

Findings: Partial necropsies of eight of the animals were performed, including external assessments and the sampling of stomach contents. No abnormalities attributable to acoustic exposure were observed, but the stomach contents indicated that the whales were feeding on cephalods soon before the stranding event. No unusual environmental events before or during the stranding event could be identified (Frantzis, 1998).

Conclusions: The timing and spatial characteristics of this stranding event were atypical of stranding in Cuvier's beaked whale, particularly in this region of the world. No natural phenomenon that might contribute to the stranding event coincided in time with the mass stranding. Because of the rarity of mass strandings in the Greek Ionian Sea, the probability that the sonar tests and stranding coincided in time and location, while being independent of each other, was estimated as being extremely low (Frantzis, 1998). However, because information for the necropsies was incomplete and inconclusive, the cause of the stranding cannot be precisely determined.

2000 Bahamas Marine Mammal Mass Stranding (March 15-16, 2000)

Description: Seventeen marine mammals comprised of nine Cuvier's beaked whales, three Blainville's beaked whales (*Mesoplodon densirostris*), two unidentified beaked whales, two minke whales (*Balaenoptera acutorostrata*), and one spotted dolphin (*Stenella frontalis*), stranded along the Northeast and Northwest Providence Channels of the Bahamas Islands on March 15-16, 2000 (Evans and England, 2001). The strandings occurred over a 36-hour period and coincided with DON use of mid-frequency active sonar within the channel. Navy ships were involved in tactical sonar exercises for approximately 16 hours on March 15. The ships, which operated the AN/SQS-53C and AN/SQS-56, moved through the channel while emitting sonar pings approximately every 24 seconds. The timing of pings was staggered between ships and average source levels of pings varied from a nominal 235 dB SPL (AN/SQS-53C) to 223 dB SPL (AN/SQS-56). The center frequency of pings was 3.3 kHz and 6.8 to 8.2 kHz, respectively.

Seven of the animals that stranded died, while ten animals were returned to the water alive. The animals known to have died included five Cuvier's beaked whales, one Blainville's beaked whale, and the single spotted dolphin. Six necropsies were performed and three of the six necropsied whales (one Cuvier's beaked whale, one Blainville's beaked whale, and the spotted dolphin) were fresh enough to permit identification of pathologies by computerized tomography

(CT). Tissues from the remaining three animals were in a state of advanced decomposition at the time of inspection.

Findings: All five necropsied beaked whales were in good body condition and did not show any signs of external trauma or disease. In the two best preserved whale specimens, hemorrhage was associated with the brain and hearing structures. Specifically, subarachnoid hemorrhage within the temporal region of the brain and intracochlear hemorrhages were noted. Similar findings of bloody effusions around the ears of two other moderately decomposed whales were consistent with the same observations in the freshest animals. In addition, three of the whales had small hemorrhages in their acoustic fats, which are fat bodies used in sound production and reception (i.e., fats of the lower jaw and the melon). The best-preserved whale demonstrated acute hemorrhage within the kidney, inflammation of the lung and lymph nodes, and congestion and mild hemorrhage in multiple other organs.

Other findings were consistent with stresses and injuries associated with the stranding process. These consisted of external scrapes, pulmonary edema and congestion. The spotted dolphin demonstrated poor body condition and evidence of a systemic debilitating disease. In addition, since the dolphin stranding site was isolated from the acoustic activities of Navy ships, it was determined that the dolphin stranding was unrelated to the presence of Navy active sonar.

Conclusions: The post-mortem analyses of stranded beaked whales led to the conclusion that the immediate cause of death resulted from overheating, cardiovascular collapse and stresses associated with being stranded on land. However, the presence of subarachnoid and intracochlear hemorrhages were believed to have occurred prior to stranding and were hypothesized as being related to an acoustic event. Passive acoustic monitoring records demonstrated that no large scale acoustic activity besides the Navy sonar exercise occurred in the times surrounding the stranding event. The mechanism by which sonar could have caused the observed traumas or caused the animals to strand was undetermined. The spotted dolphin was in overall poor condition for examination, but showed indications of long-term disease. No analysis of baleen whales (minke whale) was conducted.

2000 Madeira Island, Portugal Beaked Whale Strandings (May 10 – 14, 2000)

Description: Three Cuvier’s beaked whales stranded on two islands in the Madeira Archipelago, Portugal, from May 10–14, 2000 (Cox et al., 2006). A fourth animal was reported floating in the Madeiran waters by fishermen, but did not come ashore (no necropsy was performed on this animal) (Ketten, 2005). A joint NATO amphibious training exercise, named “Linked Seas 2000,” which involved participants from 17 countries, took place in Portugal during May 2–15, 2000. The timing and location of the exercises overlapped with that of the stranding incident.

Findings: Two of the three whales were necropsied. Two heads were taken to be examined. One head was intact and examined grossly and by CT; the other was only grossly examined because it was partially flensed and had been seared from an attempt to dispose of the whale by fire (Ketten, 2005). No blunt trauma was observed in any of the whales. Consistent with prior CT scans of beaked whales stranded in the Bahamas 2000 incident, one whale demonstrated subarachnoid and peribullar hemorrhage and blood within one of the brain ventricles. Post-cranially, the freshest whale demonstrated renal congestion and hemorrhage, which was also consistent with findings in the freshest specimens in the Bahamas incident.

Conclusions: The pattern of injury to the brain and auditory system were similar to those observed in the Bahamas strandings, as were the kidney lesions and hemorrhage and congestion in the lungs (Ketten, 2005). The similarities in pathology and stranding patterns between these two events suggested a similar causative mechanism. Although the details about whether or how sonar was used during "Linked Seas 2000" is unknown, the presence of naval activity within the region at the time of the strandings suggested a possible relationship to Navy activity.

2002 Canary Islands Beaked Whale Mass Stranding (24 September 2002)

Description: On September 24, 2002, 14 beaked whales stranded on Fuerteventura and Lanzaote Islands in the Canary Islands (Jepson et al., 2003). Seven of the 14 whales died on the beach and the 7 were returned to the ocean. Four beaked whales were found stranded dead over the next three days either on the coast or floating offshore (Fernández et al., 2005). At the time of the strandings, an international naval exercise called Neo-Tapon, involving numerous surface warships and several submarines was being conducted off the coast of the Canary Islands. Tactical mid-frequency active sonar was utilized during the exercises, and strandings began within hours of the onset of the use of mid-frequency sonar (Fernández et al., 2005).

Findings: Eight Cuvier's beaked whales, one Blainville's beaked whale, and one Gervais' beaked whale were necropsied; six of them within 12 hours of stranding (Fernández et al., 2005). The stomachs of the whales contained fresh and undigested prey contents. No pathogenic bacteria were isolated from the whales, although parasites were found in the kidneys of all of the animals. The head and neck lymph nodes were congested and hemorrhages were noted in multiple tissues and organs, including the kidney, brain, ears, and jaws. Widespread fat emboli were found throughout the carcasses, but no evidence of blunt trauma was observed in the whales. In addition, the parenchyma of several organs contained macroscopic intravascular bubbles and lesions, putatively associated with nitrogen off-gassing.

Conclusions: The association of NATO mid-frequency sonar use close in space and time to the beaked whale strandings, and the similarity between this stranding event and previous beaked whale mass strandings coincident with sonar use, suggests that a similar scenario and causative mechanism of stranding may be shared between the events. Beaked whales stranded in this event demonstrated brain and auditory system injuries, hemorrhages, and congestion in multiple organs, similar to the pathological findings of the Bahamas and Madeira stranding events. In addition, the necropsy results of Canary Islands stranding event lead to the hypothesis that the presence of disseminated and widespread gas bubbles and fat emboli were indicative of nitrogen bubble formation, similar to what might be expected in decompression sickness (Jepson et al., 2003; Fernández et al., 2005). Whereas gas emboli would develop from the nitrogen gas, fat emboli would enter the blood stream from ruptured fat cells (presumably where nitrogen bubble formation occurs) or through the coalescence of lipid bodies within the blood stream.

The possibility that the gas and fat emboli found by Fernández et al. (2005) was due to nitrogen bubble formation has been hypothesized to be related to either direct activation of the bubble by sonar signals or to a behavioral response in which the beaked whales flee to the surface following sonar exposure. The first hypothesis is related to rectified diffusion (Crum and Mao, 1996), the process of increasing the size of a bubble by exposing it to a sound field. This process is facilitated if the environment in which the ensonified bubbles exist is supersaturated with gas. Repetitive diving by marine mammals can cause the blood and some tissues to accumulate gas to a greater degree than is supported by the surrounding environmental pressure (Ridgway and Howard, 1979). Deeper and longer dives of some marine mammals, such as those conducted by beaked whales, are theoretically predicted to induce greater levels of supersaturation (Houser et al., 2001). If rectified diffusion were possible in marine mammals exposed to high-level sound, conditions of tissue supersaturation could theoretically speed the rate and increase the size of bubble growth. Subsequent effects due to tissue trauma and emboli would presumably mirror those observed in humans suffering from decompression sickness.

It is unlikely that the short duration of sonar pings would be long enough to drive bubble growth to any substantial size, if such a phenomenon occurs. However, an alternative but related hypothesis has also been suggested: stable bubbles could be destabilized by high-level sound exposures such that bubble growth then occurs through static diffusion of gas out of the tissues. In such a scenario the marine mammal would need to be in a gas-supersaturated state for a long enough period of time for bubbles to become of a problematic size. The second hypothesis speculates that rapid ascent to the surface following exposure to a startling sound might produce tissue gas saturation sufficient for the evolution of nitrogen bubbles (Jepson et al., 2003; Fernández et al., 2005). In this scenario, the rate of ascent would need to be sufficiently rapid to compromise behavioral or physiological protections against nitrogen bubble formation. Zimmer and Tyack (2007) also speculated that if repetitive shallow dives are used by beaked whales to avoid a sound source, they might accumulate higher than normal levels of nitrogen gas because of the increased time spent at depths where gas exchange across the lung still occurs (i.e. above the depth of lung collapse).

Although theoretical predictions suggest the possibility for acoustically mediated bubble growth, there is considerable disagreement among scientists as to its likelihood (Piantadosi and Thalmann, 2004). Sound exposure levels predicted to cause in vivo bubble formation within diving cetaceans have not been evaluated and are suspected as needing to be very high (Evans, 2002; Crum et al., 2005). Further, although it has been argued that traumas from recent beaked whale strandings are consistent with gas emboli and bubble-induced tissue separations (Jepson et al., 2003), there is no conclusive evidence supporting this hypothesis and there is concern that at least some of the pathological findings (e.g., bubble emboli) are artifacts of the necropsy.

2006 Spain, Gulf of Vera Beaked Whale Mass Stranding (26-27 January 2006)

Description: The Spanish Cetacean Society reported an atypical mass stranding of four beaked whales that occurred January 26, 2006, on the southeast coast of Spain near Mojacar (Gulf of Vera) in the Western Mediterranean Sea. According to the report, two of the whales were discovered the evening of January 26 and were found to be still alive. Two other whales were discovered during the day on January 27, but had already died. A following report stated that the first three animals were located near the town of Mojacar and were examined by a team from the University of Las Palmas de Gran Canarias, with the help of the stranding network of Ecologistas en Acción Almería-PROMAR and others from the Spanish Cetacean Society. The fourth animal was found dead on the afternoon of January 27, a few kilometers north of the first three animals.

From January 25-26, 2006, a NATO surface ship group (seven ships including one U.S. ship under NATO operational command) conducted active sonar training against a Spanish submarine within 93 km (50 NM) of the stranding site.

Findings: Veterinary pathologists necropsied the two male and two female beaked whales (*Z. cavirostris*).

Conclusions: According to the pathologists, a likely cause of this type of beaked whale mass stranding event may have been anthropogenic acoustic activities. However, no detailed pathological results confirming this supposition have been published to date, and no positive acoustic link was established as a direct cause of the stranding.

Even though no causal link can be made between the stranding event and naval exercises, certain conditions may have existed in the exercise area that, in their aggregate, may have contributed to the marine mammal strandings (Freitas, 2004):

- Operations were conducted in areas of at least 1,000 m (3,281 ft) in depth near a shoreline where there is a rapid change in bathymetry on the order of 1,000 to 6,000 m (3,281 to 19,685 ft) occurring a cross a relatively short horizontal distance (Freitas, 2004).

- Multiple ships, in this instance, five MFA sonar equipped vessels, were operating in the same area over extended periods of time (20 hours) in close proximity.

- Exercises took place in an area surrounded by landmasses, or in an embayment. Operations involving multiple ships employing mid-frequency active sonar near land may produce sound directed towards a channel or embayment that may cut off the lines of egress for marine mammals (Freitas, 2004).

E.4.2 Other Global Stranding Discussions

In the following sections, stranding events that have been putatively linked to DON activity in popular press are presented. As detailed in the individual case study conclusions, the DON believes that there is enough evidence available to refute allegations of impacts from mid-frequency sonar.

Stranding Events Case Studies

2003 Washington State Harbor Porpoise Strandings (May 2 – June 2, 2003)

Description: At 10:40 a.m. on May 5, 2003, the USS SHOUP began the use of mid-frequency tactical active sonar as part of a naval exercise. At 2:20 p.m., the USS SHOUP entered the Haro Strait and terminated active sonar use at 2:38 p.m., thus limiting active sonar use within the strait to less than 20 minutes. Between May 2 and June 2, 2003, approximately 16 strandings involving 15 harbor porpoises (*Phocoena phocoena*) and one Dall's porpoise (*Phocoenoides dalli*) were reported to the Northwest Marine Mammal Stranding Network. A comprehensive review of all strandings and the events involving USS SHOUP on May 5, 2003, were presented in DON (2004). Given that the USS SHOUP was known to have operated sonar in the strait on May 5, and that behavioral reactions of killer whales (*Orcinus orca*) had been putatively linked to these sonar operations (NMFS Office of Protected Resources, 2005), NMFS undertook an analysis of whether sonar caused the strandings of the harbor porpoises.

Whole carcasses of ten of harbor porpoises and the head of an additional porpoise were collected for analysis. Necropsies were performed on ten of the harbor porpoises and six whole carcasses and two heads were selected for CT imaging. Gross examination, histopathology, age determination, blubber analysis, and various other analyses were conducted on each of the carcasses (Norman et al., 2004).

Findings: Post-mortem findings and analysis details are found in Norman et al. (2004). All of the carcasses suffered from some degree of freeze-thaw artifact that hampered gross and histological evaluations. At the time of necropsy, three of the porpoises were moderately fresh, whereas the remainder of the carcasses was considered to have moderate to advanced decomposition. None of the 11 harbor porpoises demonstrated signs of acoustic trauma. In contrast, a putative cause of death was determined for five of the porpoises; two animals had blunt trauma injuries and three animals had indication of disease processes (fibrous peritonitis, salmonellosis, and necrotizing pneumonia). A cause of death could not be determined in the remaining animals, which is consistent with expected percentage of marine mammal necropsies conducted within the northwest region.

Conclusions: NMFS concluded from a retrospective analysis of stranding events that the number of harbor porpoise stranding events in the approximate month surrounding the USS SHOUP use of sonar was higher than expected based on annual strandings of harbor porpoises (Norman et al., 2004). It is important to note that the number of strandings in the May-June timeframe in

2003 was also higher for the outer coast, indicating a much wider phenemona than use of sonar by USS SHOUP in Puget Sound for one day in May. The conclusion by NMFS that the number of strandings in 2003 was higher is also different from that of The Whale Museum, which has documented and responded to harbor porpoise strandings since 1980 (Osborne, 2003). According to The Whale Museum, the number of strandings as of May 15, 2003, was consistent with what was expected based on historical stranding records and was less than that occurring in certain years. For example, since 1992 the San Juan Stranding Network has documented an average of 5.8 porpoise strandings per year. In 1997, there were 12 strandings in the San Juan Islands with more than 30 strandings throughout the general Puget Sound area. Disregarding the discrepancy in the historical rate of porpoise strandings and its relation to the USS SHOUP, NMFS acknowledged that the intense level of media attention focused on the strandings likely resulted in an increased reporting effort by the public over that which is normally observed (Norman et al., 2004). NMFS also noted in its report that the "sample size is too small and biased to infer a specific relationship with respect to sonar usage and subsequent strandings."

Seven of the porpoises collected and analyzed died prior to SHOUP departing to sea on May 5, 2003. Of these seven, one, discovered on May 5, 2003, was in a state of moderate decomposition, indicating it died before May 5; the cause of death was determined to be due, most likely, to salmonella septicemia. Another porpoise, discovered at Port Angeles on May 6, 2003, was in a state of moderate decomposition, indicating that this porpoise also died prior to May 5. One stranded harbor porpoise discovered fresh on May 6 is the only animal that could potentially be linked in time to the USS SHOUP's May 5 active sonar use. Necropsy results for this porpoise found no evidence of acoustic trauma. The remaining eight strandings were discovered one to three weeks after the USS SHOUP's May 5 transit of the Haro Strait, making it difficult to causally link the sonar activities of the USS SHOUP to the timing of the strandings. Two of the eight porpoises died from blunt trauma injury and a third suffered from parasitic infestation, which possibly contributed to its death (Norman et al., 2004). For the remaining five porpoises, NMFS was unable to identify the causes of death.

The speculative association of the harbor porpoise strandings to the use of sonar by the USS SHOUP is inconsistent with prior stranding events linked to the use of mid-frequency sonar. Specifically, in prior events, the stranding of whales occurred over a short period of time (less than 36 hours), stranded individuals were spatially co-located, traumas in stranded animals were consistent between events, and active sonar was known or suspected to be in use. Although mid-frequency active sonar was used by the USS SHOUP, the distribution of harbor porpoise strandings by location and with respect to time surrounding the event do not support the suggestion that mid-frequency active sonar was a cause of harbor porpoise strandings. Rather, a complete lack of evidence of any acoustic trauma within the harbor porpoises, and the identification of probable causes of stranding or death in several animals, further supports the conclusion that harbor porpoise strandings were unrelated to the sonar activities of the USS SHOUP (DON, 2004).

2004 Hawai'i Melon-Headed Whale Mass Stranding (July 3-4, 2004)

Description: The majority of the following information is taken from the NMFS report on the stranding event (Southall et al., 2006). On the morning of July 3, 2004, 150 to 200 melon-headed whales (*Peponocephala electra*) entered Hanalei Bay, Kauai. Individuals attending a canoe blessing ceremony observed the animals entering the bay at approximately 7:00 a.m. The whales were reported entering the bay in a "wave as if they were chasing fish" (Braun 2005). At 6:45 a.m. on July 3, 2004, approximately 46.3 km (25 NM) north of Hanalei Bay, active sonar was tested briefly prior to the start of an anti-submarine warfare exercise.

The whales stopped in the southwest portion of the bay, grouping tightly, and displayed spy-hopping and tail-slapping behavior. As people went into the water among the whales, the pod separated into as many as four groups, with individual animals moving among the clusters. This continued through most of the day, with the animals slowly moving south and then southeast within the bay. By about 3 p.m., police arrived and kept people from interacting with the animals. At 4:45 p.m. on July 3, 2004, the RIMPAC Battle Watch Captain received a call from a National Marine Fisheries representative in Honolulu, Hawaii, reporting the sighting of as many as 200 melon-headed whales in Hanalei Bay. At 4:47 p.m. the Battle Watch Captain directed all ships in the area to cease active sonar transmissions.

At 7:20 p.m. on July 3, 2004, the whales were observed in a tight single pod 68.6 m (75 yards) from the southeast side of the bay. The pod was circling in a group and displayed frequent tail slapping and whistle vocalizations and some spy hopping. No predators were observed in the bay and no animals were reported as having fresh injuries. The pod stayed in the bay through the night of July 3, 2004.

On the morning of July 4, 2004, the whales were observed to still be in the bay and collected in a tight group. A decision was made at that time to attempt to herd the animals out of the bay. A 213 to 244-m (700- to 800-ft) rope was constructed by weaving together beach morning glory vines. This vine rope was tied between two canoes and with the assistance of 30 to 40 kayaks, was used to herd the animals out of the bay. By approximately 11:30 a.m. on July 4, 2004, the pod was coaxed out of the bay.

A single neonate melon-headed whale was observed in the bay on the afternoon of July 4, after the whale pod had left the bay. The following morning on July 5, 2004, the neonate was found stranded on Lumahai Beach. It was pushed back into the water but was found stranded dead between 9 and 10 a.m. near the Hanalei pier. NMFS collected the carcass and had it shipped to California for necropsy, tissue collection, and diagnostic imaging.

Following the stranding event, NMFS undertook an investigation of possible causative factors of the stranding. This analysis included available information on environmental factors, biological factors, and an analysis of the potential for sonar involvement. The latter analysis included vessels that utilized mid-frequency active sonar on the afternoon and evening of July 2. These vessels were to the southeast of Kauai, on the opposite side of the island from Hanalei Bay.

Findings: NMFS concluded from the acoustic analysis that the melon-headed whales would have had to have been on the southeast side of Kauai on July 2 to have been exposed to sonar from naval vessels on that day (Southall et al., 2006). There was no indication whether the animals were in that region or whether they were elsewhere on July 2. NMFS concluded that the animals would have had to swim from 1.4 to 4.0 m/s (3 to 9 mi/hr) for 6.5 to 17.5 hours after sonar transmissions ceased to reach Hanalei Bay by 7:00 a.m. on July 3. Sound transmissions by ships to the north of Hanalei Bay on July 3 were produced as part of exercises between 6:45 a.m. and 4:47 p.m. Propagation analysis conducted by the 3rd Fleet estimated that the level of sound from these transmissions at the mouth of Hanalei Bay could have ranged from 138 to 149 dB re: 1 μPa.

NMFS was unable to determine any environmental factors (e.g., harmful algal blooms, weather conditions) that may have contributed to the stranding. However, additional analysis by Navy investigators found that a full moon occurred the evening before the stranding and was coupled with a squid run (Mobley et al., 2007). In addition, a group of 500 to 700 melon-headed whales were observed to come close to shore and interact with humans in Sasanhaya Bay, Rota, on the same morning as the whales entered Hanalei Bay (Jefferson et al., 2006). Previous records further indicated that, though the entrance of melon-headed whales into the shallows is rare, it is not unprecedented. A pod of melon-headed whales entered Hilo Bay in the 1870s in a manner similar to that which occurred at Hanalei Bay in 2004.

The necropsy of the melon-headed whale calf suggested that the animal died from a lack of nutrition, likely following separation from its mother. The calf was estimated to be approximately one week old. Although the calf appeared not to have eaten for some time, it was not possible to determine whether the calf had ever nursed after it was born. The calf showed no signs of blunt trauma or viral disease and had no indications of acoustic injury.

Conclusions: Although it is not impossible, it is unlikely that the sound level from the sonar caused the melon-headed whales to enter Hanalei Bay. This conclusion is based on a number of factors:

1. The speculation that the whales may have been exposed to sonar the day before and then fled to the Hanalei Bay is not supported by reasonable expectation of animal behavior and swim speeds. The flight response of the animals would have had to persist for many hours following the cessation of sonar transmissions. Such responses have not been observed in marine mammals and no documentation of such persistent flight response after the cessation of a frightening stimulus has been observed in other mammals. The swim speeds, though feasible for the species, are highly unlikely to be maintained for the durations proposed, particularly since the pod was a mixed group containing both adults and neonates. Whereas Southall et al. (2006) suggest that the animals would have had to swim from 1.4 to 4.0 m/s (3 to 9 mi/hr) for 6.5 to 17.5 hours, it is improbable that a neonate could achieve the same for a period of many hours.

2. The area between the islands of Oahu and Kauai and the Pacific Missile Range Facility (PMRF) training range have been used in RIMPAC exercises for more than 20 years, and are used year-round for ASW training using mid frequency active sonar. Melon-headed whales inhabiting the waters around Kauai are likely not naive to the sound of sonar and there has never been another stranding event associated in time with ASW training at Kauai or in the Hawaiian Islands. Similarly, the waters surrounding Hawaii contain an abundance of marine mammals, many of which would have been exposed to the same sonar operations that were speculated to have affected the melon-headed whales. No other strandings were reported coincident with the RIMPAC exercises. This leaves it uncertain as to why melon-headed whales, and no other species of marine mammal, would respond to the sonar exposure by stranding.

3. At the nominal swim speed for melon-headed whales, the whales had to be within 2.8 and 3.7 km (1.5 and 2 NM) of Hanalei Bay before sonar was activated on July 3. The whales were not in their open ocean habitat but had to be close to shore at 6:45 a.m. when the sonar was activated to have been observed inside Hanalei Bay from the beach by 7:00 a.m. (Hanalei Bay is very large area). This observation suggests that other potential factors could be causative of the stranding event (see below).

4. The simultaneous movement of 500 to 700 melon-headed whales and Risso's dolphins into Sasanhaya Bay, Rota, in the Northern Marianas Islands on the same morning as the 2004 Hanalei stranding (Jefferson et al., 2006) suggests that there may be a common factor which prompted the melon-headed whales to approach the shoreline. A full moon occurred the evening before the stranding and a run of squid was reported concomitant with the lunar activity (Mobley et al., 2007). Thus, it is possible that the melon-headed whales were capitalizing on a lunar event that provided an opportunity for relatively easy prey capture. A report of a pod entering Hilo Bay in the 1870s indicates that on at least one other occasion, melon-headed whales entered a bay in a manner similar to the occurrence at Hanalei Bay in July 2004. Thus, although melon-headed whales entering shallow embayments may be an infrequent event, and every such event might be considered anomalous, there is precedent for the occurrence.

5. The received noise sound levels at the bay were estimated to range from roughly 95 to 149 dB re: 1 µPa. Received levels as a function of time of day have not been reported, so it is not possible to determine when the presumed highest levels would have occurred and for how long. However, received levels in the upper range would have been audible by human participants in the bay. The statement by one interviewee that he heard "pings" that lasted an hour and that they were loud enough to hurt his ears is unreliable. Received levels necessary to cause pain over the duration stated would have been observed by most individuals in the

water with the animals. No other such reports were obtained from people interacting with the animals in the water.

Although NMFS concluded that sonar use was a “plausible, if not likely, contributing factor in what may have been a confluence of events (Southall et al., 2006)," this conclusion was based primarily on the basis that there was an absence of any other compelling explanation. The authors of the NMFS report on the incident were unaware, at the time of publication, of the simultaneous event in Rota. In light of the simultaneous Rota event, the Hanalei stranding does not appear as anomalous as initially presented and the speculation that sonar was a causative factor is weakened. The Hanalei Bay incident does not share the characteristics observed with other mass strandings of whales coincident with sonar activity (e.g., specific traumas, species composition, etc.). In addition, the inability to conclusively link or exclude the impact of other environmental factors makes a causal link between sonar and the melon-headed whale strandings highly speculative at best.

1980- 2004 Beaked Whale Strandings in Japan (Brownell et al. 2004)

Description: Brownell et al. (2004) compared the historical occurrence of beaked whale strandings in Japan (where there are U.S. naval bases) with strandings in New Zealand (which lacks a U.S. naval base) and concluded the higher number of strandings in Japan may be related to the presence of U.S. Navy vessels using mid-frequency sonar. While the dates for the strandings were well documented, the authors of the study did not attempt to correlate the dates of any Navy activities or exercises with the dates of the strandings.

To fully investigate the allegation made by Brownell et al. (2004), the Center for Naval Analysis (CNA) looked at the past U.S. Naval exercise schedules from 1980 to 2004 for the water around Japan in comparison to the dates for the strandings provided by Brownell et al. (2004). None of the strandings occurred during or within weeks after any DON exercises. While the CNA analysis began by investigating the probabilistic nature of any co-occurrences, the results were a 100 percent probability that the strandings and sonar use were not correlated by time. Given there was no instance of co-occurrence in over 20 years of stranding data, it can be reasonably postulated that sonar use in Japanese waters by DON vessels did not lead to any of the strandings documented by Brownell et al. (2004).

2004 Alaska Beaked Whale Strandings (June 17 to July 19, 2004)

Description: Between June 17 and July 19, 2004, five beaked whales were discovered at various locations along 2,575 km (1,389.4 NM) of the Alaskan coastline, and one was found floating (dead) at sea. Because the DON exercise Alaska Shield/Northern Edge 2004 occurred within the approximate timeframe of these strandings, it has been alleged that sonar may have been the probable cause of these strandings.

The Alaska Shield/Northern Edge 2004 exercise consisted of a vessel-tracking event followed by a vessel-boarding search-and-seizure event. There was no ASW component to the exercise, no use of mid-frequency sonar, and no use of explosives in the water. There were no events in the Alaska Shield/Northern Edge exercise that could have caused any of the strandings over this 33 day period.

2005 North Carolina Marine Mammal Mass Stranding Event (January 15-16, 2005)

Description: On January 15 and 16, 2005, 36 marine mammals consisting of 33 short-finned pilot whales, one minke whale, and two dwarf sperm whales stranded alive on the beaches of North Carolina (Hohn et al., 2006a). The animals were scattered across a 111-km (59.9-NM) area from Cape Hatteras northward. Because of the live stranding of multiple species, the event was classified as a UME (Unusual Mortality Event). It is the only stranding on record for the region in which multiple offshore species were observed to strand within a two- to three-day period.

The DON indicated that from January 12 to 14, some unit level training with mid-frequency active sonar was conducted by vessels that were 93 to 185 km (50.2 to 99.8 NM) from Oregon Inlet. An expeditionary strike group was also conducting exercises to the southeast, but the closest point of active sonar transmission to the inlet was 650 km (350.7 NM) away. The unit level operations were not unusual for the area or time of year and the vessels were not involved in antisubmarine warfare exercises. Marine mammal observers on board the vessels did not detect any marine mammals during the period of unit level training. No sonar transmissions were made on January 15-16.

The National Weather Service reported that a severe weather event moved through North Carolina on January 13 and 14 (Figure E-3). The event was caused by an intense cold front that moved into an unusually warm and moist air mass that had been persisting across the eastern United States for about a week. The weather caused flooding in the western part of the state, considerable wind damage in central regions of the state, and at least three tornadoes that were reported in the north central part of the state. Severe, sustained (one to four days) winter storms are common for this region.

Over a two-day period (January 16-17), two dwarf sperm whales, 27 pilot whales, and one minke whale were necropsied and tissue samples collected. Twenty-five of the stranded cetacean heads were examined; two pilot whale heads and the heads of the dwarf sperm whales were analyzed by CT.

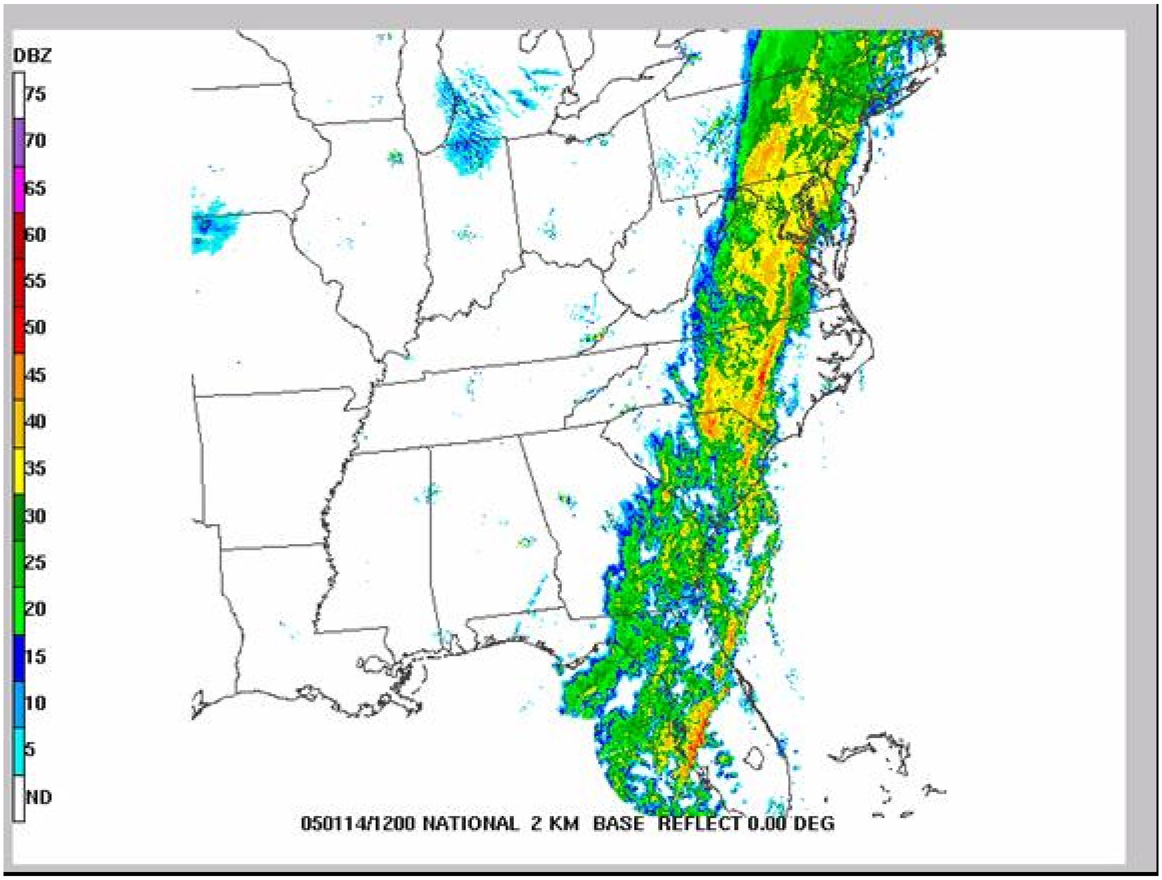

Figure E-3

Regional radar imagery for the East Coast (including North Carolina) on July 14.
Note: The time of the image is approximately 7 a.m.

Findings: The pilot whales and dwarf sperm whale were not emaciated, but the minke whale, which was believed to be a dependent calf, was emaciated. Many of the animals were on the beach for an extended period of time prior to necropsy and sampling, and many of the biochemical abnormalities noted in the animals were suspected of being related to the stranding and prolonged time on land. Lesions were observed in all of the organs, but there was no consistency across species. Musculoskeletal disease was observed in two pilot whales and cardiovascular disease was observed in one dwarf sperm whale and one pilot whale. Parasites were a common finding in the pilot whales and dwarf sperm whales but were considered consistent with the expected parasite load for wild odontocetes. None of the animals exhibited traumas similar to those observed in prior stranding events associated with mid-frequency sonar activity. Specifically, there was an absence of auditory system trauma and no evidence of distributed and widespread bubble lesions or fat emboli, as was previously observed (Fernández et al., 2005).

Sonar transmissions prior to the strandings were limited in nature and did not share the concentration identified in previous events associated with mid-frequency active sonar use (Evans and England, 2001). The operational/environmental conditions were also dissimilar (e.g., no constrictive channel and a limited number of ships and sonar transmissions). NMFS noted that environmental conditions were favorable for a shift from up-welling to down-welling conditions, which could have contributed to the event. However, other severe storm conditions existed in the days surrounding the strandings and the impact of these weather conditions on at-sea conditions is unknown. No harmful algal blooms were noted along the coastline.

Conclusions: All of the species involved in this stranding event are known to strand in this region. Although the cause of the stranding could not be determined, several whales had preexisting conditions that could have contributed to the stranding. Cause of death for many of the whales was likely due to the physiological stresses associated with being stranded. A consistent suite of injuries across species, which was consistent with prior strandings where sonar exposure is expected to be a causative mechanism, was not observed.

NMFS was unable to determine any causative role that sonar may have played in the stranding event. The acoustic modeling performed, as in the Hanalei Bay incident, was hampered by uncertainty regarding the location of the animals at the time of sonar transmissions. However, as in the Hanalei Bay incident, the response of the animals following the cessation of transmissions would imply a flight response that persisted for many hours after the sound source was no longer operational. In contrast, the presence of a severe weather event passing through North Carolina during January 13 and 14 is a possible contributing factor to the North Carolina UME of January 15.

E.5 Stranding Section Conclusions

Marine mammal strandings have been a historic and ongoing occurrence attributed to a variety of causes. Over the last fifty years, increased awareness and reporting has led to more information about species effected and raised concerns about anthropogenic sources of stranding. While there has been some marine mammal mortalities potentially associated with mid-frequency sonar effects to a small number of species (primarily limited numbers of certain species of beaked whales), the significance and actual causative reason for any impacts is still subject to continued investigation. ICES (2005a) noted, that taken in context of marine mammal populations in general, sonar is not a major threat, nor a significant contributor to the overall ocean noise budget. However, continued research based on sound scientific principles is needed in order to avoid speculation as to stranding causes, and to further our understanding of potential effects or lack of effects from military mid-frequency sonar (Bradshaw et al., 2006; ICES 2005b; Barlow and Gisiner, 2006; Cox et al. 2006).

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APPENDIX F

COASTAL CONSISTENCY DETERMINATIONS

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F COASTAL CONSISTENCY DETERMINATIONS

F.1 Introduction

The Coastal Zone Management Act (CZMA) of 1972 (16 U.S.C. 1451 "*et seq.*") was enacted to protect coastal resources from growing demands associated with commercial, residential, recreational and industrial uses. The CZMA allows coastal states to develop a Coastal Zone Management Plan (CZMP) whereby they designate permissible land and water use within the state's coastal zone. States then have the opportunity to review and comment on federal agency activities that could affect the state's coastal zone or its resources.

Federal agency activities potentially affecting a state's coastal zone must be consistent, to the maximum extent practicable, with the enforceable policies of the state's coastal management program. The enforceable policies of a state's coastal management program for purposes of federal consistency consist of management programs adopted by a coastal state in accordance with the provisions of sections 305 and 306, (16 U.S.C. 1454, 1455(d)) of the CZMA and approved by the Assistant Administrator for the Ocean Services and Coastal Zone Management, National Oceanic and Atmospheric Administration (NOAA), U.S. Department of Commerce. In addition, the enforceable policies of a state must be legally binding through constitutional provisions, laws, regulations, land use plans, ordinances or judicial or administrative decisions, by which a state exerts control over private and public land and water uses and natural resources in the coastal zone and which are incorporated in a management program as approved by the Office of Ocean and Coastal Resource Management, NOAA, either as part of the program approval described above or as a program change in accordance with the procedures detailed in 16 U.S.C. 1455(e). Typically, a state's CZMP will focus on the protection of physical, biological, and socioeconomic resources.

Review of federal agency activities is conducted through the submittal of either a Consistency Determination or a Negative Determination. A federal agency shall submit a Consistency Determination when it determines that its activity may have either a direct or an indirect effect on a state's coastal zone or resources. In accordance with 15 CFR 930.39, the consistency determination shall include a brief statement indicating whether the proposed activity will be undertaken in a manner consistent to the maximum extent practicable with the enforceable policies of the management program and should be based upon an evaluation of the relevant enforceable policies of the management program.

Pursuant to 15 CFR 930.41, the state has 60 days from the receipt of the Consistency Determination in which to concur with or object to the Consistency Determination, or to request an extension under 15 CFR 930.41(b). Federal agencies shall approve one request for an extension period of 15 days or less.

A federal agency may submit a Negative Determination to a coastal state when the federal agency has determined that its activities would not have an effect on the state's coastal zone or its resources or when conducting the same or similar activities for which Consistency Determinations have been prepared in the past. Pursuant to 15 CFR 930.35 the state has 60 days to review a federal agency's Negative Determination. States are not required to concur with a Negative Determination, and if the federal agency has not received a response from the state by the 60th day of submittal, it may proceed with its action. However, within the 60-day review period, a state agency may request, and the federal agency shall approve, one request for an extension period of 15 days or less.

In accordance with the CZMA, the U.S. Navy submitted a Consistency Determination only for the preferred alternative at Site A offshore Northeastern Florida to the states of Florida and Georgia. A copy of the CZMA determination letter is enclosed in this Appendix F. As of the date of this document, the Navy has not received the state's response.

FLORIDA COASTAL CONSISTENCY DETERMINATION

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FLORIDA UNDERSEA WARFARE TRAINING RANGE (USWTR)
COASTAL CONSISTENCY DETERMINATION

27 April 2009

This document provides the State of Florida with the Department of the Navy's Coastal Consistency Determination (CCD) under the Coastal Zone Management Act (CZMA), 16 United States Code (U.S.C.) § 1456, Section 307(c)(1) and 15 Code of Federal Regulations (CFR) Section 930.36 for the proposed USWTR, and the preferred alternative located offshore of Northeastern Florida in the U.S. Navy's Jacksonville Operating Area. The State of Florida requires that federal agencies conduct a CZMA Consistency Determination for certain direct federal action, federal permits and licenses, and federal assistance programs that occur within the State's designated coastal zone, and have the potential to affect the State's coastal zone resources. Section 304(1) of the CZMA defines the seaward extent of a state's coastal zone as "*to the outer limit of state title and ownership under the Submerged Lands Act (43 U.S.C. 1301 et. seq.)*. "Under the Submerged Lands Act, Florida's title and ownership extends 5.6 kilometers (km) (3 nautical miles [NM]) into the Atlantic Ocean and, in accordance with United States vs. Louisiana, et al., 364 U.S. 502 (1960), approximately 16.7 kilometers (km) (9 NM) into the Gulf of Mexico. The entire State of Florida and the waters therein are also considered a part of the coastal zone. Based on the analysis in the Draft Environmental Impact Statement (EIS)/Overseas EIS, the proposed action requires a CZMA CCD because of the potential to impact coastal resources within the State of Florida's coastal zone. Based upon a review of the Florida Coastal Management Program (FCMP), the Department of the Navy (DoN) has determined that the proposed action is consistent to the maximum extent practicable with the enforceable policies of Florida's approved coastal management program.

1.0 FEDERAL AGENCY ACTION

DoN proposes to instrument a 1,713-square-kilometer (km^2) (500-square-nautical mile [NM^2]) area of the ocean with undersea cables and sensor nodes and to use the area for anti-submarine warfare (ASW) training. The landward edge of the USWTR would be located approximately 93 km (50 NM) offshore of Northeastern Florida and well outside of Florida coastal waters.

Within the State's coastal zone, a trunk cable connecting the range to the shore facilities at Naval Station (NAVSTA) Mayport would be buried to a depth of approximately 0.3 to 0.9 meters (m) (1 to 3 feet [ft]). Ocean-bottom burial equipment would be used to cut (hard bottom) or plow (soft sediment) a furrow approximately 10 centimeters (cm) (4 inches [in]) wide, in which the 5.8-cm (2.3-in) cable would be placed. Cable installation would be accomplished using a tracked, remotely operated mechanical cable burial vehicle.

The trunk cable would be brought on shore and secured on land with a deadman (i.e., anchoring device). A 10-cm (4-in) conduit would be installed under the dunes to the east of the proposed cable termination facility (CTF) with the seaward end of the conduit emerging on the beach near the surf zone. The conduit would be installed using directional drilling techniques. From the land side termination point of the conduit to the CTF, the cable would be installed in a 0.6-m- (2-ft-) wide, 0.9-m- (3-ft-) deep trench.

The CTF would be an approximately 37-m^2 (400-ft^2) structure that would house the power supplies, system electronics, and communications gear necessary to operate the offshore range. Commercial power and telecommunications connections would be made to the NAVSTA Mayport infrastructure. The communications signals would be routed to the range operations center at the Fleet Area Control and Surveillance Facility, Jacksonville, and electronics would be housed at the terminal end of the communications link.

2.0 PURPOSE

The purpose of the proposed action is to enable the U.S. Navy to train effectively in an at-sea environment ranging in water depth from 36 to 274 m (20 to 900 ft) at a suitable location for Atlantic Fleet units. The U.S. Navy's primary mission is to maintain, train, equip, and operate combat-ready Naval forces capable of winning wars, deterring aggression, and maintaining freedom of the seas. ASW is a critical part of that mission. Atlantic Fleet units deploy worldwide and shifts in the military strategic landscape require increased Naval capability in the world's shallow, or littoral, seas. Training effectively for these littoral environments requires the availability of realistic conditions in which actual potential combat situations can be adequately simulated. The U.S. Navy currently lacks an instrumented shallow water (encompassing depths of 36 to 274 m [120 to 900 ft]) training range offshore of the east coast of the United States that is geographically and oceanographically similar to potential strategic areas.

3.0 FLORIDA COASTAL MANAGEMENT PROGRAM

The FCMP Act, adopted in 1978, authorized the development of a coastal management program. FCMP was approved by the National Oceanic and Atmospheric Administration (NOAA) in 1981. It consists of a network of 23 Florida statutes administered by eight state agencies and five of the five water management districts. The program is designed to ensure the wise use and protection of the State's water, cultural, historic, and biological resources; to minimize the State's vulnerability to coastal hazards; to ensure compliance with the State's growth management laws; to protect the State's transportation system; and to protect the State's proprietary interest as the owner of sovereign submerged lands. NAVSTA Mayport falls within the City of Jacksonville, which is a participating agency in the FCMP. In the "Conservation/Coastal Element" of its 2010 comprehensive plan, the City outlines 11 goals with supporting policies that direct the management and conservation of coastal resources.

4.0 ANALYSIS

4.1 FCMP STATUTES

Each of the 23 Florida statutes is evaluated in the following sections for applicability to the USWTR project. When applicable, the project's consistency with these statutes is discussed. NAVSTA Mayport is federal property and, therefore, does not fall within the jurisdiction of the Florida coastal zone. State coastal zone that may potentially be affected by the proposed action is limited to the coastal Atlantic Ocean (within 6 km [3 NM]) adjacent to NAVSTA Mayport. Other state-regulated resources aboard NAVSTA Mayport, such as tidal wetlands and threatened and endangered species, are also discussed. Activities associated with ASW training on the proposed USWTR would not affect the State's coastal zone or affect any land or water use, or natural resource of the coastal zone; therefore this Consistency Determination does not include operations on the USWTR.

4.1.1 Beach and Shore Preservation (Chapter 161)

This policy authorizes the Bureau of Beaches and Coastal Systems within the Florida Department of Environmental Protection to regulate construction on or seaward of the State's beaches. The proposed action would be consistent with this statute because it would be undertaken in such a manner that would ensure the protection of beach/dune systems. The cable would be installed under the dunes to the east of the proposed CTF using directional drilling, with the seaward end of the conduit emerging on the beach near the surf zone, therefore, not affecting the dune system. Cable burial is the only activity proposed for the area seaward of the mean high water line and within the States' coastal waters, and therefore, this policy is not applicable to the proposed action**.**

4.1.2 Growth Policy, County and Municipal Planning, Land Development Regulation (Chapter 163, Part II)

This policy requires local governments to prepare, adopt, and implement comprehensive plans that encourage the most appropriate use of land and natural resources in a manner consistent with the public interest. The proposed action includes no comprehensive plans for land and natural resource use as is pertains to the Florida coastal zone. Furthermore, because NAVSTA Mayport is federal property, state and local planning is not applicable on the base.

4.1.3 State and Regional Planning (Chapter 186)

This statute details state-level planning requirements. It requires the development of special statewide plans governing water use, land development, and transportation. The proposed action does not include any development of plans to govern water use, land development, or transportation. Furthermore, because NAVSTA Mayport is federal property, state and local planning is not applicable to the base.

4.1.4 Emergency Management (Chapter 252)

This policy provides for planning and implementation of the state's response to, efforts to recover from, and the mitigation of, natural and manmade disasters. The proposed action at NAVSTA Mayport would not increase the State's vulnerability to natural disasters. Moreover, emergency response and evacuation procedures are not applicable to the proposed action.

4.1.5 State Lands (Chapter 253)

This policy addresses the state's administration of public lands and property of this state and provides direction regarding the acquisition, disposal, and management of all state lands. The proposed action aboard NAVSTA Mayport would not apply since this is federal property. No special aquatic sites are located within the project area, and a water quality management plan would be implemented prior to burying the cable into the sea floor with the States coastal zone.

Installing the cable would require an Army Corps of Engineers permit to comply with the Clean Water Act, Section 404, and Rivers and Harbors Act, Section 10. A State of Florida Program General Permit that authorizes submerged utility lines and associated dredging or excavation would also be acquired before any installation activities began.

4.1.6 State Parks and Preserves (Chapter 258)

This policy addresses administration and management of state parks and preserves. The proposed action would not affect any state parks or preserves, and therefore this policy is not applicable.

4.1.7 Land Acquisitions for Conservation or Recreation (Chapter 259)

This policy authorizes acquisition of environmentally endangered lands and outdoor recreation lands. The proposed action would not affect any land acquisition for conservation and recreation, and therefore, this policy is not applicable.

4.1.8 Florida Greenways and Trails Act (Chapter 260)

This policy authorizes acquisition of land to create a recreational trails system and to facilitate management of the system. The proposed USWTR would avoid the recreational trails system and would not affect the management of the system. Hence, this statute is not applicable.

4.1.9 Historical Resources (Chapter 267)

This policy addresses management and preservation of the state's archaeological and historical resources. There would be no effects to historical resources at the NAVSTA Mayport site or the adjacent State coastal waters, as there are no known cultural resources in the immediate vicinity of the proposed project area. The proposed action would not affect any cultural resources; therefore, this policy is not applicable to the proposed action.

4.1.10 Commercial Development and Capital Improvements (Chapter 288)

This policy provides the framework for promoting and developing the general business, trade, and tourism components of the state economy. The proposed action would not involve any commercial development or capital improvements that would affect the business, trade, or tourist components of the state economy, and therefore, this policy is not applicable.

4.1.11 Transportation Administration (Chapter 334)

This policy addresses the state's policy concerning transportation administration. The proposed action would not affect transportation, and therefore, this policy is not applicable.

4.1.12 Transportation Finance and Planning (Chapter 339)

This statute addresses the finance and planning needs of the state's transportation system. The proposed action would not affect transportation, and therefore, this policy is not applicable.

4.1.13 Saltwater Fisheries (Chapter 370)

This policy addresses management and protection of the state's saltwater fisheries. The installation of cables may result in the temporary displacement of benthic fish. Ocean bottom burial equipment would disturb a relatively narrow path of 5 m (16 ft), while digging the 10-cm (4-in) furrow in which to bury the cable. Because the equipment would only be present in any given area for a few hours, any impacts would be minor and very brief. Therefore, it is not anticipated that there would be any lethal or long-term impact to fish. Management of fisheries stocks would not be affected by implementation of the USWTR at the Mayport landfall site, and no significant impacts to fish habitats are expected. Implementation of the USWTR at the NAVSTA Mayport landfall site would be consistent with this policy on saltwater fisheries.

4.1.14 Wildlife (Chapter 372)

This policy addresses the management of the wildlife resources of the state. The proposed action would not significantly affect wildlife. There could be temporary impacts to the nesting activities of the loggerhead and green sea turtles if installation were to occur during nesting months; however, under such circumstances, consultation with the U.S. Fish and Wildlife Service would be arranged before initiating any construction activities. Further, current conservation measures in place at NAVSTA Mayport beach would minimize or eliminate the potential for adverse impact. These conservation measures include marking known sea turtle nesting areas with protective fencing and avoiding disturbance of those areas. Finally, installation of the cable across the beach and installation of the CTF would not affect NAVSTA Mayports' ability to conduct current wildlife conservation measures. The proposed action would be consistent with this policy.

4.1.15 Water Resources (Chapter 373)

This policy addresses the state's policy concerning water resources. Installation of the trunk cable at the proposed landfall site would cause minimal, short-term impacts to water quality because bottom sediments would be disturbed. Disturbed bottom sediments can cause increased turbidity that can clog fish gills and can decrease oxygen levels and photosynthesis; however, in this case the increased turbidity would not pose a significant impact, given its limited duration. Additionally, in coastal waters, suspension of bottom sediments is a natural occurrence with passing coastal storms. Construction of the landside facility is not expected to impair coastal water quality. Implementation of the USWTR would be consistent with coastal water quality policies.

4.1.16 Outdoor Recreation and Conservation Lands (Chapter 375)

This statute authorizes the state to acquire lands, water areas, and related resources for outdoor recreation and conservation. The proposed USWTR would not affect the development of a comprehensive multipurpose outdoor recreation plan that documents recreational supply and demand, describes current recreational opportunities, estimates need for additional recreational opportunities, and proposes means to meet the identified needs. Therefore, this statute is not applicable.

4.1.17 Pollutant Discharge Prevention and Removal (Chapter 376)

This policy regulates transfer, storage, and transportation of pollutants, and cleanup of pollutant discharges. The proposed action at the NAVSTA Mayport landfall site would not result in the production of hazardous waste or the discharge of pollution; therefore, this policy is not applicable.

4.1.18 Energy Resources (Chapter 377)

This statute addresses regulation, planning, and development of energy resources of the state. The proposed action would not affect energy resources, and therefore, this policy is not applicable.

4.1.19 Land and Water Management (Chapter 380)

This policy establishes land and water management policies to guide and coordinate local decisions relating to growth and development. The proposed action would primarily occur on federally-owned lands. Under the proposed action, development of state lands would not occur. Areas of critical state concern, or areas with approved state resource management plans, would not be affected. Changes to coastal infrastructure, such as bridge construction, capacity increases of existing coastal infrastructure, or use of state funds for infrastructure planning, designing, or construction would not occur. Therefore, this policy is not applicable to the proposed action.

4.1.20 Public Health, General Provisions (Chapter 381)

The proposed action does not involve the construction of an on-site sewage treatment and disposal system. Consequently, this statute that relates to public policy concerning the state's public health system is not applicable.

4.1.21 Mosquito Control (Chapter 388)

This statute addresses mosquito control efforts in the state. The proposed action would not affect mosquito control, and therefore, this policy is not applicable.

4.1.22 Environmental Control (Chapter 403)

This statute establishes public policy concerning environmental control in the state. Installation of the trunk cable at the proposed landfall site would cause minimal, short-term impacts to water quality because bottom sediments would be disturbed, however this would not pose a significant impact, given its limited duration. Effects to ecological systems or air quality are not anticipated. The proposed action would be consistent with this policy.

4.1.23 Soil and Water Conservation (Chapter 582)

This policy provides for the control and prevention of soil erosion. Soil and erosion control measures would be implemented as par to of the construction and installation process aboard NAVSTA Mayport. Therefore, the proposed action would not result in soil erosion and/or significant impacts to water quality from soil erosion. Soil and water conservation policies would continue to be followed as currently practiced at NAVSTA Mayport. The proposed action is consistent with this policy.

4.2 CITY OF JACKSONVILLE COMPREHENSIVE PLAN

The following text addresses the applicability of the City of Jacksonville's 11 goals, objectives, and policies with respect to the proposed action at the NAVSTA Mayport landfall site.

4.2.1 Air Quality

There would be no new sources of air pollutants at the landside facility. Furthermore, the Clean Air Act (CAA) conformity rules would not apply to the landside facilities or in nearshore areas within the 6-km (3-NM) jurisdiction of the CAA, as they would be within an attainment area for all criteria pollutants. Air quality impacts from construction activities at NAVSTA Mayport would be from fugitive dust generated on site and mobile source emissions from construction vehicles and workers' automobiles. These impacts would be minor and would be short-term in nature. Thus, the construction and operation of the proposed USWTR would have no significant impact on air quality in the vicinity of NAVSTA Mayport and would be consistent with air quality policies.

4.2.2 Water Quality

Installation of the trunk cable at the proposed landfall site would cause minimal, short-term impacts to water quality because bottom sediments would be disturbed. Disturbed bottom sediments can cause increased turbidity that can clog fish gills and can decrease oxygen levels and photosynthesis; however, in this case the increased turbidity would not pose a significant impact, given its limited duration. Additionally, in coastal waters, suspension of bottom sediments is a natural occurrence with passing coastal storms. Construction of the landside facility is not expected to impair coastal water quality. Implementation and operation of the proposed USWTR would be consistent with coastal water quality policies.

4.2.3 Native Ecological Communities

The cable would be installed under the dunes to the east of the proposed cable termination facility using directional drilling, with the seaward end of the conduit emerging on the beach near the surf zone. This underground installation would not impact any native ecological communities within the City of Jacksonville, and therefore, policies with regard to native ecological communities are not applicable.

4.2.4 Wetlands Conservation

The CTF would be sited to avoid wetlands. While installing the landside portion of the trunk cable, directional drilling would be used to avoid wetlands to the maximum extent practicable. If wetlands were to be impacted, the U.S. Navy would obtain the appropriate Section 404 wetland permit from the U.S. Army Corps of Engineers prior to construction, and would implement mitigation as required by wetland permit conditions. The State of Florida has issued a State Program General Permit that authorizes submerged utility lines and associated dredging or excavation that would also be obtained, if necessary. The proposed action would be consistent with the City of Jacksonville's wetlands conservation policy.

4.2.5 Unique or Sensitive Environments

There are no unique or sensitive habitats in the vicinity of the proposed landfall site at NAVSTA Mayport; therefore, policies regarding unique or sensitive environments are not applicable.

4.2.6 Sandy Beaches and Shorelines

Aboard NAVSTA Mayport, the cable would be installed under the dunes to the east of the proposed cable termination facility using directional drilling, with the seaward end of the conduit emerging on the beach near the surf zone. This underground installation would not impact the beaches or shoreline within the City of Jacksonville, and therefore, polities regarding sandy beaches and shorelines are not applicable.

4.2.7 Coastal Storm-Related Public Safety and Health

Installation of the trunk cable at the proposed landfall site and construction of the landside facility would involve directional drilling under the dune system. The cable installation would take place in an ocean hazard area, but is not a structure. The CTF is the only structure, but is located outside of the ocean hazard area. The proposed USWTR is consistent with policies on coastal storm-related public safety and health.

4.2.8 Historical Resources

There would be no adverse impacts on historical resources at the NAVSTA Mayport site, as there are no known cultural resources in the immediate vicinity of the site. The proposed action would not effect cultural resources and coordination with the State Historic Preservation Office is not required; therefore, policies regarding historical resources are not applicable to the proposed action.

4.2.9 Level of Service Standards

The proposed action would not involve the introduction of new vehicular traffic, so policies regarding traffic level of service standards are not applicable.

4.2.10 Siting and Operation of Boat Facilities

The proposed action would not involve, nor would it impact, the siting and operation of boat facilities; therefore, policies regarding siting and operation of boat facilities are not applicable.

4.2.11 Compatible Development

The proposed action would be consistent with the military land use of NAVSTA Mayport.

5.0 CONCLUSION

In conclusion, after careful consideration of the proposed action, the DoN has determined that the installation and operation of the USWTR would be consistent to the maximum extent practicable with the NOAA-approved enforceable policies of the FCMP and the *City of Jacksonville Comprehensive Plan*.

Commentor	Comments	Navy's Response
Florida DEP - Lynn Griffin	"The DEIS presents a project concept and general maps, but should provide diagrams or maps of cable routes and sonar nodes in relation to benthic resources, artificial reefs, fisheries habitat, etc. More information on installation methodologies is required. For example, the cable burial vehicle is described as having a width of 16 ft., but the DEIS does not clarify whether that equates to a 16-ft. impact swath along the entire estimated 600 nautical miles of cable to be installed. In addition, there are no maps showing precisely where the trunk cable would come on shore. Although the trunk cable is only 2.5 inches in diameter, the DEIS mentions that it will be installed via directional drilling, but does not provide details on the extent of disturbance related to its installation."	The text for Chapter 2 of the FEIS has been revised and can help address this comment.
Florida DEP - Lynn Griffin	"The DEIS should include detailed maps depicting the locations of benthic resources in relation to proposed structures and cables. Benthic resource information should be obtained from biological and photographic surveys using protocols sufficient to allow the types and areal extent of affected resources and ecosystems, especially those that may be unique to the area, to be quantified and mapped."	Revised text from Chapter 2 of the FEIS states: The risk of harming benthic organisms during the installation of the cable and nodes would be minimized by thoroughly surveying the area prior to the burial process. The survey would use multi-beam sonar to collect information such as bathymetry, seabed morphology at scales of 1.6 to 33 feet (0.5 to 10 meters), sediment types, and surface geology. This information would be coupled with photographs of the ocean bottom and biological/geological samples to provide accurate data on the location of existing habitats.
Florida DEP - Lynn Griffin	"The DEIS should examine and quantify all permanent, temporary and secondary impacts to habitats, especially the acreage of live and hardbottom to be eliminated or disturbed by installation of the cable grid and the long term effects of USWTR training activities. The DEIS should describe how these impacts will be avoided or minimized. Resource impact evaluations and project alternatives should be based on complete descriptions of all aspects of the proposed activities, including alignment and construction options."	The text for Chapter 2 of the FEIS has been revised and can help address this comment.

Commentor	Comments	Navy's Response
Florida DEP - Lynn Griffin	"A discussion of mitigation for unavoidable impacts to resources should be included in the DEIS and address impacts to all marine resources, not only marine mammals, resulting from the installation and operational use of the established training area. In particular, the DEIS should evaluate the need for mitigation of any potential long-term effects of operational waste materials left on the seafloor ecosystem."	The Navy is making every effort to minimize waste materials during installation and operation of the range (refer to revised Subchapter 4.1), and will adhere to all relevant regulatory requirements regarding mitigation of impacts.
Florida DEP - general	"Will other types of exercises be conducted on the USWTR besides the Anti-submarine Warfare (ASW). If so, please explain."	A description of all of the training to be performed on the USWTR can be found in Chapter 2 and Subchapter 4.8 of the EIS.
Florida DEP - general	"From the table presented, it appears that the USWTR will have almost constant use. Was this accounted for when analyzing the possible effects on coastal and marine resources? Will this significantly increase the amount of ship traffic coming out of Jacksonville on a daily basis, if so, how much? Could this increased traffic affect the areas of known North Atlantic right whale habitat?"	The frequent use of the USWTR was accounted for when analyzing the effects to coastal and marine resources. It is not anticipated that ship traffic out of Naval Station Mayport would increase as a result of the construction of the USWTR, as these same ships are already transiting the right whale critical habitat to train out at sea.
Florida DEP - general	"It is stated that materials left in place are not expected to result in any significant degradation of the environment. Please provide MSDS sheets on all materials expected to be expendable and references to support the statement."	The Navy is making every effort to minimize waste materials during installation and operation of the range (refer to Subchapter 4.1), and will adhere to all relevant regulatory requirements regarding mitigation of impacts. Material Safety Data Sheets (MSDSs) are documents containing information on the potential effects on human health from exposure to chemicals. MSDSs describe possible hazards involved with the chemicals/products, how to use them safely, what to do when accidents occur, and how to recognize symptoms of overexposure. This information is not relevant to Subchapter 4.1.2 of the FEIS, which discusses potential releases of toxic materials to the ocean environment and potential effects on marine organisms. The analysis provided in the FEIS indicates that expended materials pose negligible risks to marine organisms.

Commentor	Comments	Navy's Response
Florida DEP - general	"Although the material left in place may not pose a hazard as it decomposes, could accidental ingestion occur? What is the likely hood that these materials may resemble food sources for ESA species?"	Please refer to Subchapter 4.2.4.5. Parachutes used are large in comparison with turtles' normal food items, and would be very difficult to ingest.
Florida DEP - general	"Please explain why part of the proposed project is located in international waters? Why was the Exclusive Economic Zone (EEZ) not included in the analysis of the proposed project's boundaries? The next to last paragraph stated the Navy could issue notice to mariners, advising of potentially hazardous operations, but the next paragraph states that the USWTR operations would have to avoid shipping vessels transiting through the range. Please explain. How many notices to mariners would be issued each year? At the open house, it was suggested that recreational and commercial fishing does occur in the proposed project area. Would this notice exclude recreational and commercial fishermen from using the area?"	USWTR is located within the U.S. EEZ and not international waters, as incorrectly reported in portions of the DEIS. Please refer to Subchapter 1.5 for a discussion of how Executive Order 12114 applies to the analysis of USWTR. In addition, refer to Subchapter 4.4.2.2 regarding Notices to Mariners, which would only be used if deemed necessary. No restricted areas of navigation are proposed to be implemented for the USWTR, so the Navy would be required to wait for recreational and commercial vessels to clear the range area prior to commencement of training exercises.
Florida DEP - general	"Please explain the determination that some impacts are outside US territory? Why was the Exclusive Economic Zone (EEZ) not included in analyzing the location of impacts? Please explain why NEPA analysis is not applied to waters out from the state-federal boundary to the EEZ."	Please refer to the discussion of the EEZ issues in Chapter 1, section 1.5.1 of the DEIS. The USWTR site is located within the exclusive economic zone of the U.S. and the environmental impacts are analyzed in the EIS under EO 12114. The Proposed Action that occurs within the U.S. territorial seas and on the shore is evaluated under the National Environmental Policy Act (NEPA).
Florida DEP - general	"Please completely describe the construction methods that will be used to bring the trunk cable onshore at Mayport Naval Station? When will the decision be made that the trunk cable or interconnect cables should be buried or not? If it is to be buried, and the local bottom type is too hard to cut, what burial alternatives are available?"	The text for Chapter 2 of the FEIS has been revised and can help address this comment. See subchapter 4.2.3 of the FEIS for a description of construction impacts.

Commentor	Comments	Navy's Response
Florida DEP - general	"This section states that directional drilling techniques will be used to bring the trunk cable on shore. Please describe the directional drilling process, in detail. Where exit/entrance pits will be located; how drilling fluids will be handled; the possibility frac outs including the procedures that will be used to minimize and respond to frac outs.	Please refer to revised Subchapter 4.1.1.1 for a description of the anticipated impacts associated with the installation of the cables and nodes. Additional information regarding installation can be found in the revised Chapter 2. Engineering design on the cable installation will be undertaken once true bottom conditions are documented through the bottom mapping effort. Once the bottom mapping is complete, definitive plans (including best management practices) will be developed specific to the surveyed site conditions.
Florida DEP - general	Please explain the term deadman anchor.	A deadman anchor is an object fixed in the ground to anchor a line or cable. This definition has been added to Subchapter 2.5.
Florida DEP - general	"Please provide a more detailed description including diagrams of the remotely operated cable burial vehicle. Please provide a more detailed description of the anticipated impacts to benthic habitats due to using the cable burial vehicle. Since the burial vehicle is approximately 16 ft in width, how will impacts to possible sensitive benthic habitat be avoided during construction of the proposed project? Please discuss if there are any other alternative construction methods to the cable burial vehicle."	The text for Chapter 2 and Subchapter 4.2.3.1 of the FEIS has been revised and can help address this comment. At this time, Navy engineers have not decided on the exact type of cable laying vehicle to be used for the construction of the USWTR, so a diagram is not able to be provided. After the completion of the bottom mapping of the range site, more definitive engineering decisions will be reached and a cable laying vehicle will be chosen.
Florida DEP - general	"The information presented represents only about 20% of the proposed site A. In meetings with the DoN, it was relayed to the state that surveys of the area were being planned. The methodology, data, and analysis from those surveys should be included in the Final EIS. Along with the sonar range, the entire run of the trunk cable should also be surveyed and analyzed."	The Navy performed data collection for the benthic studies of the trunk cable corridor in December of 2008. The results of the survey will not be available to the Navy until June of 2009, after the publication of the Final EIS. The survey of the range area itself is not slated to begin until mid to late 2009, so it likely that the results of that survey will not be available until calendar year 2010. We will share the survey data with Florida DEP once the final report is ready.
Florida DEP - general	"Please provide the state with copies of the reference DoN 2007d (Marine Resource Assessment for the Charleston/Jacksonville Operating Area)."	This reference is available on the USWTR web site at http://projects.earthtech.com/uswtr/USWTR_library/PDF_library/MRAs/MRA_CHASJAX.pdf.
Florida DEP - general	"The state recommends adjusting the boundaries of the proposed range, so the recently designated MPA would not be within the proposed range."	Please refer to Subchapter 4.2.3.1 of the FEIS. The Navy has initiated EFH consultation with the NMFS, which will include discussions regarding actions that could be taken to avoid or minimize potential impacts of the construction or operation of the USWTR on the MPA.

Commentor	Comments	Navy's Response
Florida DEP - general	"Bottom habitats in the entire range and corridor at Site A should be surveyed and analyzed for habitat types. Information collected should be forwarded to the state for review and should include maps and figures showing the designated habitats overlaid with the proposed project alignment (cable placement, sonar node placement, and impacts expected from construction and usage)."	The Navy performed data collection for the benthic studies of the trunk cable corridor in December of 2008. The results of the survey will not be available to the Navy until June of 2009, after the publication of the Final EIS. The survey of the range area itself is not slated to begin until mid to late 2009, so it likely that the results of that survey will not be available until calendar year 2010. We will share the results of the survey with Florida DEP once the final report is ready.
Florida DEP - general	"Information presented here in incorrect and should be updated. The Florida Coastal Management Program (FCMP) is coordinated by the Florida Department of Environmental Protection (DEP) and is the lead coastal agency pursuant to Sections 380.22(1) and 403.061(40), *Florida Statues*. The FCMP was moved from Florida Department of Community Affairs to DEP in 2002. The state's federal consistency review is specified in Section 380.23, *Florida Statutes*."	The corrected information was included in Subchapter 3.7.1 of the FEIS.
Florida DEP - general	"The third paragraph states that hard bottom ledges and biogenic reef mounds are unlikely to be impacted because of difficulty of using burial equipment in areas where those resources occur. Will these areas be avoided when laying the grid? If so, please explain how these areas will be avoided. If avoidance is not possible, please describe how impacts will be minimized. If the transmission cable cannot be buried, how will it be secured to the substrate to ensure no movement will occur?"	Data from the 2009 bathymetric survey will identify bottom ledges and biogenic reefs to be avoided to the maximum extent possible. Please refer to Subchapter 4.1.1.1: if transducer nodes or trenched cables were to be installed in biogenic reefs, permanent localized damage may occur. Subchapter 4.2.3.1: During installation, transducer nodes and cables would be placed to avoid hard bottom substrate to the maximum extent practical. Due to installation constraints, only small habitat areas and features can be avoided. The Navy is consulting with NMFS as to the impact on benthic resources, including biogenic reefs, and will implement any required mitigation measures. See Subchapter 2.2.1 for information on the placement of cable on bottom ledges. The cable will not be secured, but with 3-5% of slack, and the weight of the cable, it is not expected to be affected by the current.
Florida DEP - general	"If the ocean bottom burial equipment cannot cut the hard bottom, what other alternative methods of installation will be used?"	The text for Chapter 2 of the FEIS has been revised and can help address this comment.

Commentor	Comments	Navy's Response
Florida DEP - general	"What type of turbidity plumes are expected with the use of the bottom burial equipment? How long will the plumes last, what resources could be affected from the burial equipment?"	Please refer to the revised text in Chapter 2. In addition, revised text in Subchapter 4.1.1.1 states "Expected turbidity plumes typically would last for a few hours and occur in the area near the ocean bottom. Without currents, the effects would be confined to the immediate vicinity of the cable, i.e. within about 10 m (33 ft) from the trench. Water currents would distribute the plume over a larger area but also dilute it..."
Florida DEP - general	"Should surveys reveal deepwater corals present in the area of the proposed project, please describe what procedures that will be used to avoid and minimize impact to these resources. Deep water corals and livebottom habitats are a valuable resource providing habitats including EFH that are slow to recover from impacts."	Please refer to Subchapter 4.2.3.1. During installation, transducer nodes would be placed to avoid hard bottom substrate to the maximum extent practical. The Navy is conducting bottom mapping surveys at Site A in 2009. Data from these surveys would be used to characterize potential biological habitats and hard bottom, and minimize impacts to these habitats.
Florida DEP - general	"Deepwater corals tend grow very slowly and inhabit areas with specific requirements. Please provide references supporting the idea deepwater corals would recolonize the disturbed area created by the construction of the sonar range."	Revised text in Subchapter 4.1.1.1 states "Growth rates of branching deepwater coral species, such as *Lophelia* and *Oculina*, are relatively low, ranging from about 10. to 2.5 cm/yr (0.4 to 1 in/yr)." (This information was obtained from NOAA, NOAA Coral Reef Information System - Deepwater Corals. http://www.coris.noaa.gov/about/deep/). The Navy recognizes that the installation of the USWTR may adversely affect biogenic reef community (see Subchapter 4.2.3.1) and is currently undertaking Essential Fish Habitat (EFH) consultation with the Southeast Regional Office of the National Marine Fisheries Service.
Florida DEP - general	"What impact will the expendable materials from torpedoes that do not degrade have on the surrounding habitat? Is there possibility for entanglement or ingestion by fish, mammals, or turtles? Please provide reference that the non-inert materials would degrade, corrode, and become incorporated into the sediments. What is the timeframe for incorporation into the sediments?"	Please refer to the revised text for Subchapter 4.1.1.2. Reference is made in the revisions to information obtained from the Dabob Bay Range Complex study and the Nanoose study (both found on the attached CD). Both of these studies demonstrated that long term effects of marine expended materials, such as those to be utilized on the proposed USWTR, would have negligible long-term effects.
Florida DEP - general	"Please provide references that the sonobuoys would degrade, corrode, and become incorporated into the sediments. What is the timeframe for incorporation into the sediments?"	Please refer to the revised text for Subchapter 4.1.1.2. Reference is made in the revisions to information obtained from the Dabob Bay Range Complex study and the Nanoose study (both found on the attached CD). Both of these studies demonstrated that long term effects of marine expended materials, such as those to be utilized on the proposed USWTR, would have negligible long-term

Commentor	Comments	Navy's Response
		effects.
Florida DEP - general	"Please provide references that the targets or EMATTs would degrade, corrode and become incorporated into the sediments. How many years would this process take?"	Please refer to the revised text for Subchapter 4.1.1.2. Reference is made in the revisions to information obtained from the Dabob Bay Range Complex study and the Nanoose study (both found on the attached CD). Both of these studies demonstrated that long term effects of marine expended materials, such as those to be utilized on the proposed USWTR, would have negligible long-term effects.
Florida DEP - general	"Please provide references for the battery study of the Aid to Navigation sites in California. Please provide references for the prototype investigations."	Please refer to the referenced USEPA, 2001. In addition, the National Plan For ATON Battery Recovery and Disposal can be found at http://www.uscg.mil/directives/ci/16000-16999/CI_16478_12.pdf.
Florida DEP - general	"Please provide tables detailing the impacts to resources."	Please refer to table ES-3 in the Executive Summary. In addition, please refer to table 4.8-5.
Florida DEP - general	"While unburied transducers may provide substrate for some organisms, artificial hard substrate does not have the same replacement value as natural hardbottom."	Comment noted.
Florida DEP - general	"Are seagrasses expected in the nearshore area of the proposed project? If so, will surveys be done to determine the extent of the resource? Describe how impacts will be avoided."	All available seagrass mapping information indicates that no seagrass is present at the trunk cable site. If it is later discovered that seagrass beds are present within the proposed trunk cable route, all efforts would be made to avoid the beds by installation of the trunk cable in conduit from the shore by directional drilling. Directional drilling would begin on land and tunnel for a distance of 2,000 to 4,000 ft. If the conduit's termination point (i.e., location where the conduit exits the sea floor) cannot be positioned to avoid a sea grass bed, the impacts to the bed would be minimal. It is anticipated that the termination point impact area would be less than 10 square feet.

Commentor	Comments	Navy's Response
Florida DEP - general	"Please provide the state with a copy of the reference DoN, 2008a (EIS/OEIS Undersea Warfare Training Range, Essential Fish Habitat. Technical Report. [2008 Revision of (Department of the Navy 2007a)])."	This report is updated and is now titled "Essential Fish Habitat Assessment for the Environmental Impact Statement/Overseas Environmental Impact Statement, Undersea Warfare Training Range." It has been included on the attached CD.
Florida DEP - general	"The state recommends shifting the boundaries of the proposed project so that the North Florida MPA would not be within the proposed project site A."	Please refer to Subchapter 4.2.3.1 of the FEIS. The Navy has initiated EFH consultation with the NMFS, which will include discussions regarding actions that could be taken to avoid or minimize potential impacts of the construction or operation of the USWTR on the MPA.
Florida DEP - general	"Artificial hard substrate does not replace the value or function of a natural hardbottom."	Comment noted.
Florida DEP - general	"Please discuss if expendable materials such as wires could potentially physically impact benthic resources found within the biogenic reef community including deepwater corals. Is there a potential for the wires to wrong around organisms/benthic habitat and cause abrasion damage?"	The EIS analysis (within Subchapters 4.1 and 4.2) determined that no significant impact from expended materials will occur. The best available science is used to assess impact of expended materials on the marine environment.
Florida DEP - general	"The DEIS should include a discussion of the impact parachutes that are considered expendable and will not be recovered on benthic resources. Please discuss the impact these parachutes will have on benthic resources (smothering, entangling, etc.). What sizes are the parachutes that will be used in the project area? How long are these parachutes expected to be present before degrading? Could these parachutes be constructed of biodegradable material, so as to minimize possible impacts?"	Impacts to turtles in association with parachutes are highly unlikely due to the relatively large geographic area involved coupled with the relatively small number of sonobuoys used in each of the exercises. The best available science is used to assess impact of expended materials on the marine environment.
Florida DEP - general	"Are there any anticipated impacts from ingestion of any of the materials that are considered expendable. The only discussion of ingestion concerned the parachutes. Is there a possibility of accidental ingestion of the other expendable materials (wires, flex hoses, ect) by sea turtles and/or marine mammals?"	Due to the large size of both the flex hoses (250 ft. in length) and torpedo control wires (which vary in length, but can be miles long), ingestion of these items was not anticipated or analyzed in the EIS. Aside from their large size, these items are not likely to be mistaken for prey items for marine organisms.

Commentor	Comments	Navy's Response
Florida DEP - general	"How long will the control wires from the Mk 48 EXTORP? What is the entanglement possibility for EFH and corals from the control wires?"	Please refer to Subchapter 4.2.4.2. Due to the stiffness of torpedo control wires and flex hoses, these expended materials would not tend to form loops and entangle EFH and corals.
Florida DEP - general	"Please discuss if expendable flex hoses could pose either an entanglement issue or a continuous impact problem for EFH and/or corals present in the proposed project area."	Please refer to Subchapter 4.2.4.2. Due to the stiffness of torpedo control wires and flex hoses, these expended materials would not tend to form loops and entangle EFH and corals.
Florida DEP - general	"This section should be updated to include the two LNG projects off of Ft. Lauderdale, FL: proposed Calypso Deepwater Port and AES LNG Pipeline."	This information has been added to Subchapter 4.8.
Florida DEP - general	"Once habitat surveys are concluded cumulative effects should be reanalyzed. There is such limited data on the benthic habitat of the proposed area that a valid conclusion may not be possible without the additional data being included. In order to properly evaluate cumulative impacts, complete data for benthic resource impacts is needed."	All significant new information will be considered. The best available and most applicable science has been, and will continue to be, used. The data from the benthic survey will not be available in time for the publication of the FEIS.
Florida DEP - general	"There is no discussion of mitigation measures for impacts to benthic resources. Please detail measures that will be utilized to mitigate impacts to benthic resources."	The need for mitigation is being coordinated with the National Marine Fisheries Service in association with the Navy's EFH consultation. The Navy is conducting bottom mapping to avoid impacts to bottom habitat to the maximum extent possible.
Florida DEP - general	"Please describe avoidance and mitigation procedures to be used when training exercises are conducted in low-visibility or at night? Could the night training be curtailed or altered if it is determined that marine mammals are present in the range during certain times of the year?"	Please refer to Subchapter 6.1.2.2. Lookouts will use different techniques, including Night Lookout Techniques, during periods of low light. Lookouts will have night vision apparatuses. The Navy needs to train in all conditions to support worldwide deployment schedules. Please refer to Subchapter 1.2 for the need to train.
Florida DEP - general	"According to previous text, if a marine mammal is spotted in the area of the exercises there are procedures in place to offset any potential impact to the animal. Would this information be noted in a record for the training maneuvers? If so, could the information regarding the animal(s) be relayed to the scientific community after the maneuvers are completed and analyzed?"	The Navy has developed a monitoring program that will provide results that will be shared with the scientific community, although lookouts are not trained in the identification of specific marine mammal species.

Commentor	Comments	Navy's Response
Florida FWC - Mary Ann Poole	"We recognize and support the need for the proposed training for national security; however, based on the endangered status of the right whale and the importance of protecting their habitat along the U.S. eastern coast, our preferred alternative for this project is the 'No Action' alternative."	Comment noted. The Navy needs to train as it fights (see Chapter 1). Potential impacts to North Atlantic right whale are analyzed in depth in Chapter 4 (concluding no injurious takes due to USWTR). Additional mitigation measures, specific to right whales, are discussed in Subchapter 6.2.
Florida FWC - Mary Ann Poole	"Should the USWTR project move forward and one of the four proposed sites is selected, we strongly recommend against Site A (offshore Jacksonville) because of its proximity to the right whale calving grounds and possible negative impacts, including an anticipated increase in traffic through critical habitat."	Comment noted. The Navy needs to train as it fights (see Chapter 1). No additional traffic (over current levels) through critical habitat is anticipated. Potential impacts to North Atlantic right whale are analyzed in depth in Chapter 4 (concluding no injurious takes due to USWTR). Additional mitigation measures, specific to right whales, are discussed in Subchapter 6.2.
Florida FWC - Mary Ann Poole	"If Site A is ultimately chosen, we recommend that the Navy follows both the proposed Site A mitigation measures specified in the DEIS as well as the additional mitigation measures recommended below."	Please refer to the individual responses to each mitigation measure, below.
Florida FWC - Mary Ann Poole	"During the project activities, should there be any cetacean stranding that are temporally and spatially coincident with Navy training events, the activity should cease and the Navy should fund a thorough investigation to determine the cause of the strandings. Activities should not resume until the identified cause can be appropriately addressed."	The Navy has developed their stranding response plan in coordination with the National Marine Fisheries Service, a cooperating agency on the EIS.

Commentor	Comments	Navy's Response
Florida FWC - Mary Ann Poole	"All proposed sites should receive an NMFS Section 7 review for potential impacts to right whales as all sites are along the migratory path of right whales moving from their feeding grounds to their calving grounds. Knowledge of spatial and temporal extent of offshore migratory paths is limited, as noted above, although evidence indicates that at least some right whales are found at a distance from shore consistent with USWTR placement. The distance from shore of any of the proposed sites (Charleston OPAREA at 74 km, VACAPES OPAREA at 63 km offshore, Cherry Point OPAREA at 86 km, and Jacksonville OPAREA at 96 km offshore) does not preclude the presence of right whales; therefore, section 7 consultation is prudent for any of the proposed locations of the USWTR."	The Navy has initiated Section 7 consultation for the preferred alternative. Should the preferred alternative change, the new site would be the focus of the consultation.
Florida FWC - Mary Ann Poole	"We recommend that any mitigation measures should not be limited solely to the confines of the designated federal critical habitat boundaries, as large concentrations of right whales have been documented outside of the defined critical habitat boundary."	The Navy has developed their stranding response plan in coordination with the National Marine Fisheries Service, a cooperating agency on the EIS.
Florida FWC - Mary Ann Poole	"We recommend that the Navy make seasonal adjustments to the types and number of training scenarios. Exercises could be limited during the peak of calving season (December through March). At a minimum, the number of surface ships that must transit between Mayport and Site A should be reduced during this critical four-month period."	The Navy needs to train year-round to support worldwide deployment schedules. Please refer to Subchapter 1.2 for the need to train. In addition, Chapter 6 addresses additional mitigation measures to protect calving right whales.

Commentor	Comments	Navy's Response
Florida FWC - Mary Ann Poole	"We recommend that all Navy vessels transiting to or from Mayport and Site A should reduce speeds below the 15 to 17 knots reported as typical Navy ship transit speeds to reduce the risk of fatal collisions with right whales. The NMFS recently issues a ship speed rule (NMFS 2008) establishing a limit of 10 knots for non-exempt vessels and asking Federal vessels to voluntarily observe the rule when and where their missions would not be compromised."	Navy vessels travel at a slow, safe speed in accordance with the U.S. Coast Guard "Rules of the Road," found at http://www.navcen.uscg.gov/mwv/navrules/rotr_online.htm. NMFS exempts military vessels from the these speed restrictions due to mitigation measures previously negotiated, such as those identified in Chapter 6 of the USWTR EIS. In addition, the Navy supports the Early Warning System (EWS) for the North Atlantic right whale during the calving season in the Southeast as part of the Section 7 consultation with NOAA completed in 1997. The EWS consists of a communication network and aerial surveys that assist afloat commands to avoid North Atlantic right whale strikes in the Jacksonville/Charleston Operating Areas.
Florida FWC - Mary Ann Poole	"Navy aircraft transiting between shore and Site A (and passing over critical habitat) should maintain a maximum feasible altitude to reduce potential impacts to right whales. Non-exempted civilian aircraft are prohibited from intentionally approaching within 460 m of any right whale (NMFS 2004) and we suggest transiting Navy aircraft maintain a distance of 460 m (500 yards) whenever possible. When they occur, right whale sightings and any observed behavioral reactions to passing aircraft should be documented and reported to the Early Warning System (EWS) network."	Mitigation was developed through Section 7 consultation with NMFS and the regulations at 50 C.F.R. § 224.103(c)(3)(i), "Special Prohibitions for Marine Mammals" (please refer to Subchapter 4.3.10, "Aircraft Noise"). In addition, all sightings of right whales during calving season are reported to the Early Warning System, as detailed in Subchapter 3.2.6.1.
Florida FWC - Mary Ann Poole	"We recommend that the Navy assist in funding research on satellite tag technology that would improve the knowledge base of the migratory patterns and behaviors of right whales along the eastern U.S. seaboard. As noted previously, timing of migration is variable among years and is influenced by a number of environmental factors. The offshore extent of right whale migration, and influencing factors, are also poorly known. Satellite tagging of right whales would provide valuable information on migratory behavior that is difficult to obtain through traditional means, such as vessel or aerial studies, and would reduce uncertainty of right whale presence at the proposed USWTR."	The National Marine Fisheries Service does not generally allow the tagging of endangered species due to the possibility of injury. The Navy takes part in the Right Whale Early Warning System, a collaborative effort to track right whales through comprehensive aerial surveys conducted during the right whale calving season, with the goal of reducing the likelihood of ship strikes (please refer to Subchapter 3.2.6.1).

Commentor	Comments	Navy's Response
Florida FWC - Mary Ann Poole	"Navy protocols for detecting right whales and other cetaceans call for shipboard and/or aerial observers and passive listening for detecting right whales and other marine mammals. The amount of dive time in conjunction with weather/visibility issues, however, will limit the ability of observers to detect marine mammals. From a ship, right whales can be more difficult to identify than other cetaceans because they lack a dorsal fin. Aural detection requires that animals are vocalizing. Little is currently known about the vocalization of diving behavior of right whales on migration or on the calving grounds; therefore the existing Navy protocols offer essential but not optimal protections."	The Navy has developed their mitigation measures in coordination with the National Marine Fisheries Service, a cooperating agency on the EIS. Mitigation effectiveness is discussed in Chapter 6 of the DEIS.
Florida FWC - Mary Ann Poole	"In addition, the DEIS did not provide specifications, such as altitude, spatial or temporal extent, etc., for the aerial surveys that they propose to conduct prior to commencement of warfare exercises. The efficacy of aerial surveys for detecting all cetaceans in an area is fair at best and is dependent upon flight specifications as well as environmental factors (visibility, Beaufort Sea State levels, winds, etc.). Detectability of mom/calf pairs for standardized aerial surveys in the southeast has been estimated to be as low as 33% (Hain *et al.* 1999)."	Text in Subchapter 6.1.2.3 has been revised for the FEIS to add that helicopters would observe the vicinity of the planned antisubmarine warfare (ASW) exercises ten minutes prior to the dipping of sonobuoys. Other methods for aerial surveillance prior to and during ASW activities are listed in Subchapter 6.1.2.3 of the DEIS.
Florida FWC - Mary Ann Poole	"Because of the limitations of the proposed detection methods, we recommend that the Navy use additional methods for detecting the presence of marine mammals. Passive acoustic monitoring (e.g., using hydrophone arrays) provides greater detectabililty of vocalizing mammals than passive listening. Passive acoustic monitoring has been used previously by the Navy (Jarvis *et al.*2002) and other researchers (i.e., Clark *et al.* 1996), and should be employed routinely in naval exercises."	Please refer to Subchapter 6.1.2.6. The Navy is working to develop the capability to detect and localize vocalizing marine mammals using the installed sensor nodes (hydrophones) on the USWTR. The Navy is not yet capable of using the system nodes as a mitigation measure, however, as this science develops, it will be incorporated into the USWTR mitigation plan.

Commentor	Comments	Navy's Response
Florida FWC - Mary Ann Poole	"Additionally, the commonly publicized distance for recognizing human divers using sonar is a minimum of 700 m (i.e., http://www.arstech.de/diver_detection/diver_detection.html). Given that cetacean lungs are larger than human lungs, a cetacean should be detectable at a greater range than the customary 700 m for recognizing humans."	The Navy would use a different sonar system on USWTR (mid-frequency active sonar) than is used to detect human divers. Per operating procedures presented in revised Chapter 6, when a marine mammal is detected within 914 m of the sonar dome, sonar transmission is powered down (this distance was misprinted in the DEIS and has been corrected in the FEIS).
Florida FWC - Mary Ann Poole	"We recommend that the Navy take advantage of current detection methods, and assist with funding additional research to develop and improve methods of detecting cetaceans and recording their behavioral responses to noise exposure, such as: (a) Deploy satellite and time-depth recorders to record behavioral responses, such as diving patterns and directional changes of right whales to proposed activities, including ship transit and exposure to sonar. (b) Explore the use of low-power active sonar for detecting right whales and recording their behavioral responses to active sonar. (c) Develop a model of the propagation of sound in the shallow water environment of the chosen USWTR site for evaluating received sound levels if a marine mammal is inadvertently exposed during Navy exercises."	The Navy will implement a monitoring plan designed to investigate these issues during USWTR operation. The Navy's propagation model is appropriate for shallow water propagation.

Commentor	Comments	Navy's Response
Florida FWC - Mary Ann Poole	"Provide funding for research on the auditory characteristics of baleen whales, particularly right whales, as well as the physiological and behavioral responses to sounds. Estimates of thresholds for Temporary Threshold Shifts (TTS) and Permanent Threshold Shift (PTS) in the DEIS were largely conjecture because auditory characteristics of cetaceans, especially whales, are poorly studied. Further, behavioral responses of cetaceans to sound described in the DEIS were mainly derived from studies on captive animals (Schlundt *et al.* 2000, Finneran *et al.* 2001). Cetacean behavioral responses in the wild likely differ from those in captivity and additional studies of behavior in the wild, such as Nowacek *et al.* (2004), are needed. If any cetacean is inadvertently exposed to sonar during exercises, however, a full and thorough investigation should be conducted to evaluate impacts to the animal(s), contributing to the pool of information regarding TTS/PTS and behavioral responses of cetaceans."	The Navy will implement a monitoring plan that would monitor potential effects to marine mammals and will provide a means of assessing mitigation effectiveness. The Navy supports a number of research efforts that are investigating potential effects of sonar on marine mammals. Pease refer to Subchapter 6.1.3 in the EIS.

Commentor	Comments	Navy's Response
Florida FWC - Mary Ann Poole	"Although the Navy is proposing to reduce or cease active transmission levels when a whale or dolphin is detected within certain distances of the associated equipment (with reductions starting at 1,828 m and ceasing at 183 m), a marine mammal just outside of a 320-m detection limit could potentially receive > 181 dB re 1 µPa (based on a nominal source of 235 dB re 1 µPa @ 1 m of the SQS-53 sonar and the standard 6 dB decrease in SPL with a doubling of distance). Cetacean strandings in the Bahamas in March 2000, spatially and temporally coincident with naval exercises that were also using these mid-frequency sonars, could have been exposed to Sound Pressure Levels (SPL) of 160 dB re 1 µPa according to complex sound propagation models (International Council for the Exploration of the Sea [ICES] 2005). Likewise, strandings in the Canary Islands in September 2002 began soon after the start of naval exercises involving mid-frequency sonar (ICES 2005). The strandings mainly involved beaked whale species; however, effects of sound levels on other cetaceans, such as right whales females with calves, are largely unknown."	The risk function was developed to account for potential responses down to 120 dB SPL specifically to encompass uncertainty and the potential for behavioral reactions in marine mammal species that may be affected by sounds perceived at levels just above ambient. The Navy research continues to look into the causal mechanisms of marine mammal strandings related to sonar. Please refer to Appendix D for a discussion of specific stranding events that have been putatively linked to potential sonar operations.
Florida FWC - Mary Ann Poole	"Refined information on auditory and behavioral characteristics of cetaceans in response to sound, together with a good model of sound propagation and detection of marine mammal locations would greatly improve the ability to understand and mitigate potential impacts of these types of Navy activities."	The Navy will implement a monitoring plan that would monitor potential effects to marine mammals and will provide a means of assessing mitigation effectiveness. The Navy supports a number of research efforts that are investigating potential effects of sonar on marine mammals. Pease refer to Subchapter 6.1.3 in the EIS.

Commentor	Comments	Navy's Response
Florida FWC - Mary Ann Poole	"We commend the Navy's support of the EWS aerial surveys and recognize the important role Fleet Area Control and Surveillance Facility Jacksonville plays in the dissemination of right whale sightings. The EWS aerial surveys serve a vital role in right whale research and management in the Southeast U.S. (e.g., ship strike mitigation, photo-identification data, detection of entangled or dead whales). The Navy should continue to support the EWS and ensure that increases in Navy training exercises do not interfere with EWS aerial surveys or hinder survey efforts as a result of airspace closures."	The Navy provides about $175,000 per year in support of EWS surveys. The USWTR training will not interfere with EWS aerial surveys.
Florida FWC - Mary Ann Poole	"The seabed within the proposed USWTR area and the trunk cable from the USWTR to the cable termination facility contains some habitats that are classified as essential fish habitat (EFH) pursuant to South Atlantic Fishery Management Council regulations, including live/hardbottom habitat, existing artificial/manmade artificial reef materials, and locations proposed for future artificial reef materials. Placement of cables within the proposed USWTR may impact existing live/hardbottom habitat, existing artificial/manmade artificial reef materials, and the placement of proposed for future artificial reef materials."	The Navy is undertaking ongoing efforts to conduct hydrographic and bottom mapping surveys of the Jacksonville site and trunk cable corridor. The data obtained from these surveys will be used to identify and avoid, to the extent possible, artificial reefs and critical fish habitat areas. Furthermore, the Navy is in consultation with NMFS regarding impacts to EFH. The surveys and their corresponding reports, however, will not be complete prior to the release of the FEIS.

Commentor	Comments	Navy's Response
Florida FWC - Mary Ann Poole	"Concern #1: Fact Sheet No. Seven on the project website (http://projects.earthtech.com/USWTR/Public_Involvement/Public_Involvement_2008/PDF_fact_sheets_2008/FS7_Effects-on-Fishing-2008.pdf) illustrates the approximate locations of some of the existing artificial reef and natural areas in the vicinity of Site A, but the trunk cable location is not shown, and the illustration is not at a scale with enough detail to identify the artificial reef areas that may be effected by the proposed project. Recommendation #1: Please include figures within the EIS at appropriate scales to illustrate the location of the proposed trunk cable, the locations of the existing artificial reef permitted areas, and the existing artificial reef materials within 500 feet of the proposed trunk cable."	The trunk cable route will be planned to minimize impacts and will be addressed as part of the U.S. Army Corps of Engineers permit review. Locations of existing and permitted artificial reefs in the Jacksonville OPAREA are shown on the revised Figure 3.5-1. Information obtained as a result of the bottom mapping surveys previously mentioned will assist the Navy in engineering the cable path to avoid artificial reefs, hardbottom, shipwrecks, and other obstructions to the maximum extent practicable.
Florida FWC - Mary Ann Poole	"Concern #2: There are 25 past and present permitted artificial reef areas located offshore in Jacksonville in the Atlantic Ocean between approximately 7 and 30 nautical miles from the St. Johns River Entrance Channel (Figure 1). Most of the sites are roughly rectangular in shape, with an average area of 2.4 square miles each. We are concerned that the proposed trunk cable placement may cross some of these sites, preventing future development of some of the existing artificial reef areas. Recommendation #2: Please include in the EIS a description of the proposed route of the trunk cable, and how the existing charted artificial reef areas will be avoided."	The trunk cable route will be planned to minimize impacts and will be addressed as part of the U.S. Army Corps of Engineers permit review. Locations of existing and permitted artificial reefs in the Jacksonville OPAREA are shown on the revised Figure 3.5-1. Information obtained as a result of the bottom mapping surveys previously mentioned will assist the Navy in engineering the cable path to avoid artificial reefs, hardbottom, shipwrecks, and other obstructions to the maximum extent practicable.

Commentor	Comments	Navy's Response
Florida FWC - Mary Ann Poole	"Concern #3: In addition to the 25 existing artificial reef permitted areas which are illustrated on NOAA nautical chart #11488, there are some charted artificial reef materials and shipwrecks identified outside of the artificial reef 'Fish Haven' areas, charted as 'obstructions.' We are concerned that some of those sites may be impacted be the trunk cable placement. Recommendation #3: Please include in the EIS a description of the proposed route of the trunk cable, and how the existing artificial reef and shipwreck materials located outside the charted 'Fish Haven' areas will be avoided."	Fish havens will be evaluated and added if significantly different than the artificial reefs and live/hard bottom areas already included. The Navy is conducting ongoing hydrographic and bottom mapping surveys at the Jacksonville site. These data will be used to identify and avoid, to the extent possible, critical fish habitat areas, although the results of these surveys will not be available prior to the release of the FEIS.
Florida FWC - Mary Ann Poole	"Concern #4: During the City of Jacksonville's recent reauthorization of the existing artificial reef permitted areas, existing charted telecommunications cables were identified and avoided. The DEIS for the USWTR does not provide any information describing existing telecommunication or other transmission cables in the vicinity of the trunk cable corridor and/or USWTR and how those existing cables will be avoided. Recommendation #4: Please provide information in the EIS describing existing telecommunication or other transmission cables in the vicinity of the trunk cable corridor and/or USWTR and describe how those existing cables will be avoided."	This will be conducted as part of range development and design.

Commentor	Comments	Navy's Response
Florida FWC - Mary Ann Poole	"Concern #5: To date, the deepest artificial reef site off of Jacksonville has a maximum depth of -110 feet MLLW. The City of Jacksonville is interested in acquiring a large military ship in the future for artificial reefing, but none of the existing artificial reef site depths are deep enough to accommodate a large military ship artificial reef...Unfortunately, the location of the proposed USWTR encompasses the areas that the City of Jacksonville has been considering for a future deepwater artificial reef site. While the DEIS mentions that anchoring and trawling may be prohibited within the boundaries of the proposed USWTR, the DEIS does not specifically state whether or not future artificial reef development would be prohibited...Recommendation #5: Please include in the EIS a discussion on the possibility of permitting a future artificial reef permitted area within the boundaries of the USWTR, measuring 0.25 nm on a side, around the 150-170 ft depth contour."	The Navy has contacted the City of Jacksonville about plans for future artificial reefs and have not found that any future reefs exist within the USWTR site (see revised Figure 3.5-1). Placement of artificial reefs within the USWTR range after installation would interfere with range equipment.
Florida FWC - Mary Ann Poole	"Concern #6: The last paragraph on page 3.2-20 states 'Within Site A, hard bottom areas comprise about 97% of the surveyed area in the range (1,026 km^2 [299 NM^2]) and 97% of the surveyed area in the corridor (1,540 km^2 [449 NM^2]).' However, figure 3.2-3 clearly does not illustrate that 97% of the surveyed area is hardbottom. Recommendation #6: Please review and correct the '97%' percent hard bottom coverage references in the last paragraph of page 3.2-20."	Please refer to the revised text in Subchapter 3.2.4.1 and the EFH Assessment regarding impacts to hard bottom. These figures have been revised.
Florida FWC - Mary Ann Poole	"Concern #7: The first paragraph on page 3.2-21 provides a citation to 'FFWCC, 2005c),' but the reference list does not contain a citation for 'FFWCC, 2005c.' Recommendation #7: Please describe and add the citation for '(FFWCC, 2005c)' to the reference list."	The reference discrepancy has been addressed in Chapter 8 of the FEIS. The citation now reads "(FFWCC, 2006, 2008b)." The references are to two FFWCC web sites: http://myfwc.com/marine/ar/arOverview.html and http://myfwc.com/marine/ar/index.asp.

Commentor	Comments	Navy's Response
Florida FWC - Mary Ann Poole	"Concern #8: The DEIS references the deepwater Marine Protected Area (MPA) off North Florida that is intended to protect the habitat and stocks of deepwater overexploited fishes of the grouper-snapper complex…This is to be a Type II MPA - no anchoring or bottom fishing, no use of shark bottom longlines...The area is intended to protect species and habitat of snowy, yellowedge, and misty grouper, speckled hind and blueline tilefish all of which are longlived and experiencing overfishing. Since the USWTR encompasses the North Florida MPA in its entirety, we presume that the USWTR was intentionally sited to encompass the North Florida MPA because of the existing MPA fishing gear restrictions. The DEIS does not specifically state what sort of bottom modifications will be created by the cable within the MPA. Recommendation #8: Please provide additional description of the location of proposed cables and manner of construction that is intended to occur specifically within the boundaries of the North Florida MPA."	The text for Chapter 2 of the FEIS has been revised and can help address this comment. See subchapter 4.2.3 of the FEIS for a description of construction impacts.
Florida FWC - Mary Ann Poole	"Concern #9: While the SEAMAP mapping data provides a broad overview of the benthic habitat distribution in each region, the SEAMAP data does not provide 100% coverage of the entire proposed USWTR. The DEIS does not state whether or not the Navy intends to conduct a more detailed mapping of the seafloor prior to trenching and/or cable placement to avoid impacts to existing hardbottom resources and artificial reefs. Recommendation #9: Please provide more detailed mapping within the specific cable placement areas once those areas are chosen. Describe the methods that will be used to map, classify, and report the findings within each survey area."	Hard bottom data from the South Atlantic Fishery Management Council's Habitat and Ecosystem Interactive Map have been added to the mapping of hardbottom in the EIS. In addition, the Navy in undertaking ongoing efforts to conduct hydrographic and bottom mapping surveys of the Jacksonville site and trunk cable corridor. The data obtained from these surveys will be used to identify and avoid, to the extent possible, artificial reefs and critical fish habitat areas. Furthermore, the Navy is in consultation with NMFS regarding impacts to EFH. The surveys and their corresponding reports, however, will not be complete prior to the release of the FEIS.

Commentor	Comments	Navy's Response
Florida FWC - Mary Ann Poole	"Concern #10: The DEIS states that anchoring and trawling is proposed to be prohibited within the boundaries of USWTR Site A, but it is not clear if certain hook and line or other fishing gear types (other than bottom trawls) will be prohibited, such as shark bottom long lines, already prohibited in the North Florida MPA. Recommendation #10: Please provide additional information in the EIS on the types of fishing gears that would be prohibited or permitted within the boundaries of the proposed USWTR."	Please refer to Subchapter 4.4.2.3 of the EIS. Anchoring and trawling in USWTR will not be prohibited, nor will hook and line fishing.
Florida FWC - Mary Ann Poole	"Concern #11: The DEIS presents a weak case for predicting no significant behavioral effects on deepwater grouper-snapper complexes. If the acoustic sounds drive fish away or otherwise behaviorally impair them as in forming spawning aggregations, etc, that would be problematic especially for a special area specifically set aside as a designated marine protected area. All aspects of their deep reef natural ecology should be protected to the extent possible. Section 4.3.11 of this DEIS does not make that case for deepwater grouper-snapper complexes. Recommendation #11: The EIS should include a discussion with greater emphasis on the acoustic effects of the proposed USWTR on deepwater grouper-snapper complexes. More research is needed on the subject in order to definitely support the italic statement at the conclusion of Section 4.3.11."	The Navy is currently undertaking Essential Fish Habitat (EFH) consultation with the Southeast Regional Office of the National Marine Fisheries Service. The best available science was used in the development of the EIS and the analysis of potential impacts to fishes.

Commentor	Comments	Navy's Response
Florida FWC - Mary Ann Poole	"Concern #12: Section 6.4 of the DEIS does not state whether any mitigation measures are planned for impacts to hard bottom resources. Recommendation #12: The EIS should include a discussion of the Navy's intentions for how impacts to hard bottom resources will be offset in the event that loss of hard bottom habitat occurs during trenching and placement of offshore cables. While the preferred option is avoidance of impacts, where appropriate, construction of artificial reefs (boulder reefs, concrete modules, etc.) have been successfully constructed as mitigation for similar projects that have impacted offshore hard bottom resources."	The Navy is currently undertaking Essential Fish Habitat (EFH) consultation with the Southeast Regional Office of the National Marine Fisheries Service. The document will be modified to address any changes the come as a result of that consultation prior to the publication of the FEIS. If additional concerns are voiced by NMFS after the publication of the FEIS, those concerns will be addressed in the Navy's Record of Decision (ROD).

GEORGIA COASTAL CONSISTENCY DETERMINATION

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FEDERAL AGENCY COASTAL ZONE MANAGEMENT ACT (CZMA) NEGATIVE DETERMINATION FOR GEORGIA

27 April 2009

INTRODUCTION

This document provides the State of Georgia with the Department of the Navy's (DoN's) Negative Determination under CZMA 16 United States Code (USC) § 1451 *et seq.* and 15 Code of Federal Regulations (CFR) § 930.35. The information in this Negative Determination is provided pursuant to 15 CFR § 930.35.

This CZMA Negative Determination addresses the Proposed Action of the Undersea Warfare Training Range (USWTR) Overseas Environmental Impact Statement (OEIS)/EIS (EIS).

NEGATIVE DETERMINATION

In accordance with 15 CFR § 930.35, the DoN has reviewed Georgia's Coastal Management Program (CMP) and associated enforceable policies and has determined that the DoN's Proposed Action will have no effects on any coastal use or resource.

The DoN does not propose to conduct training or testing activities as described in the USWTR OEIS/EIS, in the State's coastal zone.

PROPOSED FEDERAL AGENCY ACTION

The DoN proposes to instrument a 1,713-square-kilometer (km^2) (500-square-nautical mile [NM^2]) area of the ocean with undersea cables and sensor nodes and to use the area for anti-submarine warfare (ASW) training. The landward edge of the undersea warfare training range (USWTR) would be located approximately 93 km (50 NM) offshore of northeastern Florida and well outside of Georgia coastal waters.

A trunk cable connecting the range to the shore facilities at Naval Station Mayport (Florida) would be buried to a depth of approximately 0.3 to 0.9 meters (m) (1 to 3 feet [ft]). Ocean-bottom burial equipment would be used to cut (hard bottom) or plow (soft sediment) a furrow approximately 10 centimeters (cm) (4 inches [in]) wide, in which the 5.8-cm (2.3-in) cable would be placed. Cable installation would be accomplished using a tracked, remotely operated mechanical cable burial vehicle.

The trunk cable would be brought on shore in Florida and secured on land with a deadman (i.e., anchoring device). A 10-cm (4-in) conduit would be installed under the dunes to the east of the proposed cable termination facility (CTF) with the seaward end of the conduit emerging on the beach near the surf zone. The conduit would be installed using directional drilling techniques. From the land side termination point of the conduit to the CTF the cable would be installed in a 0.6-m- (2-ft-) wide, 0.9-m- (3-ft-) deep trench.

The CTF would be an approximately 37-m^2 (400-ft^2) structure that would house the power supplies, system electronics, and communications gear necessary to operate the offshore range. Commercial power and telecommunications connections would be made to the Naval Station Mayport infrastructure. The communications signals would be routed to the range operations center (ROC) at the Fleet Area Control and Surveillance Facility, Jacksonville (FACSFAC JAX) and electronics would be housed at the terminal end of the communications link.

In accordance with 50 CFR Part 401.12, the DoN has prepared a separate Biological Assessment to assess the potential effects from the Proposed Action on marine resources and anadromous fish (which live in saltwater but spawn in freshwater) protected by the National Marine Fisheries Service (NMFS) under the Endangered Species Act (ESA). In accordance with the Marine Mammal Protection Act (16 USC Section 1371[a][5]), the DoN will submit, at a later date, a request for a Letter of Authorization to NMFS for the incidental taking of marine mammals by the Proposed Action and obtain a Letter of Authorization prior to the commencement of training exercises on the range.

PURPOSE AND NEED FOR ACTION

The purpose of the proposed action is to enable the DoN to train effectively in an at-sea environment ranging in water depth from 36 to 274 meters [m] (20 to 900 feet [ft]) at a suitable location for Atlantic Fleet units. The DoN's primary mission is to maintain, train, equip, and operate combat-ready naval forces capable of winning wars, deterring aggression, and maintaining freedom of the seas. Antisubmarine warfare is a critical part of that mission. Atlantic Fleet units deploy worldwide and shifts in the military strategic landscape require increased naval capability in the world's shallow, or littoral, seas. Training effectively for these littoral environments requires the availability of realistic conditions in which actual potential combat situations can be adequately simulated. The DoN currently lacks an instrumented shallow water (encompassing depths of 36 to 274 m [120 to 900 ft]) training range offshore of the east coast of the United States that is geographically and oceanographically similar to potential strategic areas.

GEORGIA'S COASTAL MANAGEMENT PROGRAM

Georgia's CMP is comprised of 33 state codes, which constitute the enforceable policies of the CMP. State codes addressed as part of the Georgia CMP consistency review and considered in the analysis of the Proposed Action are discussed in Table 1 below. The DoN has determined that implementation of the Preferred Alternative will have no effects on any coastal use or resource in Georgia's coastal zone based on the following information, data, and analysis. All of the construction and training activities would be conducted outside of Georgia territorial waters.

Georgia's CMP is comprised of the following enforceable policies:

Table 1. Georgia Coastal Management Program Consistency Review

Statute (Georgia Statute)	Consistency	Scope
OCGA 12-9-1 *Air Quality*	There would be no new sources of air pollutants in association with the USWTR. Furthermore, the Clean Air Act (CAA) conformity rules would not apply to the landside facilities or in nearshore areas within the 6-km (3-NM) jurisdiction of the CAA, as they would be within an attainment area for all criteria pollutants. Air quality impacts from construction activities at Naval Station Mayport would be from fugitive dust generated on site and mobile source	Establishes the state standards and programs, where necessary, for air quality, air emissions, construction, and release of hazardous air contaminants.

Statute (Georgia Statute)	Consistency	Scope
	emissions from construction vehicles and workers' automobiles. These impacts would be minor and would be short-term in nature. Thus, the construction and operation of the proposed USWTR would have no significant impact on air quality in the vicinity of Naval Station Mayport and would be consistent with air quality policies.	
OCGA 27-4-251 *Aquaculture Development*	The Proposed Action would not impact procedures of the Aquaculture Development Commission.	Establishes the commission to study development of aquaculture.
OCGA 52-7-1 *Boat Safety*	The Proposed Action would not impact the safety of recreational or commercial vessels in Georgia state waters, as all construction and training activities would take place in either Florida waters or seaward of Florida's territorial waters.	Provides safe boating standards on lakes, rivers, and coastal waters. Prohibits boating except at piers and marinas in waters 1,000 feet or less from Jekyll Island, Tybee Island, St. Simons Island, and Sea Island.
OCGA 12-5-320 *Coastal Management*	The Proposed Action would not impact planning activities within the coastal zone or the implementation of development requirements.	Addresses the requirements for development and implementation of coastal resource protection and their sustainable development. Requires the coordination of agencies when planning activities in the coastal zone.
OCGA 12-5-280 *Coastal Marshlands Protection*	The Proposed Action would not take place on land in Georgia. Therefore, no impacts would occur to tidal marshes, mudflats, and marshlands. Training activities would not impact estuaries.	Provides for protection of tidal wetlands through limitations and permitting of activities in these areas. Identifies exempted actions. Includes activities that take place in marshland, intertidal area, mudflats, tidal water bottoms, and salt marsh area within estuarine areas.
OCGA 12-5-370 *Safe Dams*	The Proposed Action would not impact inspections and permitting for dams.	Protects public health, safety, and welfare through inspections and permitting for dams.
OCGA 12-5-170 *Safe Drinking Water*	The Proposed Action would not impact the quality of drinking water in the state.	Addresses the state's policy concerning water resources.

Statute (Georgia Statute)	Consistency	Scope
OCGA 27-3-130 *Endangered Wildlife*	The Proposed Action would not adversely affect terrestrial or marine species. Effects to marine wildlife resources (including ESA-listed sea turtles and marine mammals) would be addressed through the federal consultation processes (Biological Assessment and Letter of Authorization) with the National Marine Fisheries Service. Mitigation measures for protection of North Atlantic right whales would be implemented from November through April, including the Early Warning System, safe vessel speeds, and stranding response plan.	Provides for protection of species that are rare, unusual, or in danger of extinction. Extends only to species on public lands which includes the subaqueous bottoms of the State.
OCGA 12-16-1 *Environmental Policy*	The Proposed Action is a federal agency activity.	Requires state agencies to prepare environmental impact reports.
OCGA 12-7-1 *Erosion and Sedimentation Control*	The construction activities associated with the Proposed Action would not take place on land within the state of Georgia.	Requires counties and municipalities to establish procedures for land-disturbance activities. Identifies permit requirements, exemptions, and best management practices.
OCGA 27-1-3 *Game and Fish Code*	The Proposed Action would not impact terrestrial wildlife or freshwater wildlife resources, or marine game and fish within the coastal zone. No activities would take place on land or in any freshwater rivers, creek, streams, or lakes.	Provides regulations for protection, management and conservation of terrestrial and fresh water wildlife resources. Identifies responsible agencies for licensing and permitting recreational and commercial fish and wildlife activities.
OCGA 12-5-90 *Groundwater Use*	The Proposed Action would not require a permit related to the Groundwater Use Act. There would be no effect to water quality or in particular, to groundwater.	Establishes regulations for development and implementation of water conservation plans. Includes coastal groundwater management plan for water conservation, protection from saltwater encroachment, reasonable uses, future development and economic development.

Statute (Georgia Statute)	Consistency	Scope
OCGA 12-8-60 *Hazardous Waste Management*	The Proposed Action would not result in significant quantities of hazardous materials or wastes. Hazardous material and waste would be managed in accordance with applicable federal and state regulations and DoD service guidelines.	Regulates all aspects of hazardous waste including generation, transport, storage, treatment, and disposal.
OCGA 12-3-70 *Heritage Trust*	The Proposed Action would not impact historical resources of the state and would avoid significant natural areas.	Preserves certain property with unique characteristics, historical significance, or recreational value.
OCGA 12-3-50 *Historic Areas*	The Proposed Action would not impact historical resources of the state. Most of the shipwrecks in the USWTR study area are along the Florida coastline, with additional shipwrecks scattered in off-shore waters. The DoN would avoid all known cultural resources.	Addresses management and preservation of the state's archaeological and historical resources.
OCGA 12-3-90 *Natural Areas*	The Proposed Action would not have a significant impact to natural areas including estuarine research reserves, and aquatic preserves. There would be no effect to the Gray's Reef National Marine Sanctuary as a result of the Proposed Action.	Identifies and preserves areas with unusual ecological significance. The goals of the act are to preserve natural plant or animal communities, rare or valuable members, and other natural features of significant scientific, educational, geologic, ecological, or scenic value.
OCGA 12-4-40 *Oil and Gas and Deep Drilling*	The Proposed Action would not affect oil or gas drilling activities or involve any deep-water drilling.	Protects underground freshwater supplies and certain environmentally sensitive areas. Sets forth standards to prevent pollution, waste, fire, and spillage related to oil, gas, or mineral exploration.
OCGA 12-4-100 *Phosphate Mining*	The Proposed Action would not take place on land in Georgia; therefore, no effects would occur to phosphate mining.	Oversees licenses for mining phosphate deposits.
OCGA 50-16-61 *Revocable License Program*	The Proposed Action does not involve construction or land activities in Georgia.	Allows for the issuance of revocable licenses for recreational docks on state-owned tidal water bottoms.

Statute (Georgia Statute)	Consistency	Scope
OCGA 52-1-30 *Right of Passage*	The Proposed Action would not result in the closure of public access areas in state waters. Temporary disruptions to recreational and commercial fisheries could occur, but would be localized and for a short duration. No long-term effects to these resources would occur.	Provides for the use of all waterways by citizens.
OCGA 12-2-1 *River Corridor Protection*	The Proposed Action would not affect river corridors, mountains, watersheds, or wetlands. No activities associated with the Proposed Action would create sedimentation or erosion in Georgia.	Protects river corridors, mountains, watersheds, and wetlands. Provides protective measures for erosion and sedimentation and inclusion in management plans.
OCGA 12-5-350 *Scenic Rivers*	The Proposed Action would not impact any scenic rivers.	Designates rivers with valuable scenic, recreational, or natural characteristics for present and future generations.
OCGA 12-3-110 *Scenic Trails*	The Proposed Action would not impact any scenic trails.	Establishes a scenic trails program.
OCGA 31-2-7 and OCGA 31-3-5.1 *Septic Tank Law*	The Proposed Action would not impact shoreline sanitation and does not include any construction or installation activities within the state of Georgia.	Regulates septic tanks including safe placement, installation, and maintenance.
OCGA 27-4-190 *Shellfish*	The Proposed Action would not impact shellfish harvesting areas and would not affect the management of shellfish resources.	Provides the regulations to harvest shellfish including licensing, approving areas for commercial harvest, and water quality monitoring.
OCGA 2-5-230 *Shore Protection*	The Proposed Action would not adversely affect the shoreline or access to the beach as no land activities would occur in Georgia.	Provides for protection and management of sand dunes, beaches, sandbars, and shoals. Identifies limitations and permitting requirements related to construction, storage, parking, vehicle operation and related activities. Provides for public access and recreation at or near the beach.

Statute (Georgia Statute)	Consistency	Scope
OCGA 12-8-21 *Solid Waste Management*	The Proposed Action would not involve the generation of solid waste within the state's coastal zone. All solid waste disposals would be conducted in accordance with DoN policies and procedures.	Sets forth the rules for solid waste handling facilities and processes to site new facilities.
O.G.C. 12-4-70 *Surface Mining*	The Proposed Action would not impact surface mining.	Regulates surface mining in the state and coastal zone.
O.G.C. 52-1-1 *Protection of Tidewaters*	The Proposed Action would not result in the closure of areas within state tidewaters. No removal of structures or construction activities would occur.	Provides for the use of all tidewaters by citizens. Allows for removal of structures.
O.G.C. 12-13-1 *Underground Storage Tank*	The Proposed Action does not include any construction or operation of landside facilities. There would be no landside activities in Georgia.	Provides regulations to operate, detect releases, take corrective actions, and enforce the use of underground storage tanks. Ensures the protection of human health and safety and protection and maintenance of groundwater quality and surface water resources from contamination.
OCGA 12-5-20 *Water Quality Control*	The Proposed Action would not result in significant impact to water quality from expended components.	Ensures that water uses are prudent, maintains or restores purity, and provides an adequate supply. Regulates the use of rivers, streams, lakes, and subsurface waters for public and private water supply; and agricultural, industrial, and recreational uses is provided. Requires compliance with the Georgia Water Quality Control Act for activities in the coastal zone including tourism and recreation, manufacturing and transportation, and other activities.

Statute (Georgia Statute)	Consistency	Scope
OCGA 12-5-120 *Water Wells Standards*	The Proposed Action would not include the construction, operation, or maintenance of water wells.	Requires compliance with the Water Wells Standards Act and regulates the siting, construction operation, maintenance, and abandon of wells and boreholes. Authorizes a council to adopt and amend rules to govern the licensing of well contractors.
OCGA 12-6-170 *Wildflower Preservation*	The Proposed Action would not occur on land in Georgia.	Designates and protects plant species that are rare, unusual, or in danger of extinction on public lands.

CONCLUSION

In conclusion, after careful consideration of the proposed action, the DoN has determined that the installation and operation of the USWTR would be consistent to the maximum extent practicable with the National Oceanic and Atmospheric Administration- (NOAA-) approved enforceable policies of the Georgia Coastal Management Program.

Comments	Navy's Response
"Given the importance of Georgia and Florida coastal waters to endangered North Atlantic right whales, and given the proximity of the proposed USWTR range to the right whale calving grounds, our chief recommendation would normally be that the Navy avoid conducting USWTR activities between November 15 and April 15 each year (i.e. when right whales are present off Georgia and Florida). Unfortunately, this option has been explicitly eliminated from consideration in the DEIS/OEIS. We urge the Navy to reconsider this decision. Avoiding or significantly reducing the scope of ASW activities between November 15 and April 15 would be the simplest way to reduce potential impacts to right whales and right whale habitat."	The Navy has mitigation measures in place specific to operations conducted within the right whale critical habitat off the Georgia/Florida coasts that include posting additional lookouts, reducing speed and minimizing time spent in this area. Actual training on the range will occur further offshore than the coastal habitat preferred by mother/calf pairs. Construction during this period will be avoided, as detailed in Subchapter 6.4.
"Installation of the range should occur between April 15 and November 15 to avoid impacting North Atlantic right whales."	Construction during the calving season will be avoided, as detailed in Subchapter 6.4.
"We question the accuracy of the Acoustic Effects Analysis given how little is known about the density data at the heart of the analysis (i.e. Navy OPAREA Density Estimates) are spatially and temporally coarse in scale, and therefore inappropriate for fine- scale analysis that was conducted in the DEIS/OEIS. Rather, we recommend that comprehensive marine mammal surveys be conducted within the proposed USWTR area across all seasons in order to calculate accurate season-specific estimates of marine mammal density. This point is particularly important for North Atlantic right whales because the density of right whales beyond 30 NM of shore in unknown. Accurate right whale density estimates for waters beyond 30 NM are needed in order to predict impacts to right whales. The revised density estimates should be incorporated into the Acoustic Effects Analysis prior to publication of the Final EIS; they should also be considered by NMFS prior to issuing a Letter of Authorization (LOA) or consulting with the Navy under Section 7 of the Endangered Species Act (ESA)."	The Navy OPAREA Density Estimates (NODES) report has been placed on the project web site; it utilizes the best available method in density modeling. Navy used aerial and ship-board survey data from National Marine Fisheries Service going back to 1998 to develop these density estimates.

Comments	Navy's Response
"The Navy estimated the annual "Acoustic Footprint" and exposure levels in its Acoustic Effects Analysis, but did not present this information in the DEIS/OEIS. This information is needed to assess the environmental impacts of the project and should be included in the Final EIS."	A Range Distance Table has been placed in Chapter 4 of the Final EIS. The maximum distance sonar energy will travel is 147 km (approximately 80 nautical miles), but levels at this distance from the source are not expected to cause harassments. As detailed in the referenced table, harassments are expected to drop substantially at distances greater than 43.8 km (approximately 24 nautical miles) from the source.
"The maximum distance at which Level B harassment will occur from sonar sources is not provided in the DEIS/OEIS. This is particularly important given the proximity of the USWTR project area to the right whale calving ground. The Navy should address whether sonar energy will propagate from the USWTR and into areas inhabited by right whales. This information should be included in the Final EIS; it should also be considered by NMFS prior to issuing a LOA or consulting with the Navy under Section 7 of the ESA."	A Range Distance Table has been placed in Chapter 4 of the Final EIS. The maximum distance sonar energy will travel is 147 km (approximately 80 nautical miles), but levels at this distance from the source are not expected to cause harassments. As detailed in the referenced table, harassments are expected to drop substantially at distances greater than 43.8 km (approximately 24 nautical miles) from the source.
"If sound is likely to propagate from the USWTR and into the right whale calving grounds, the potential for cumulative negative impacts on individual right whales and their habitat should be considered. Breeding females return to the waters off Georgia and northeast Florida every 3-5 years to calve. Immature right whales often return to the calving grounds each winter during the first few years of their lives. These individual whales may remain in waters off Georgia and Florida for extended periods (3-4 months). As such, the potential for cumulative impacts on individual whales should not be discounted."	The Navy consulted with National Marine Fisheries Service, who is a cooperating agency on the EIS. Please refer to Chapter 4.8 regarding the assessment of cumulative impacts.
"The Navy's Integrated Comprehensive Monitoring Program (ICMP) should include a program for monitoring the long-term acoustic effects of USWTR activities on the project area and the adjacent right whale calving grounds. This program should be implemented in cooperation with NMFS and independent researchers."	Comment noted. The Navy will be implementing a monitoring program for USWTR in coordination with NMFS in accordance with the Marine Mammal Protection Act and the Endangered Species Act.

Comments	Navy's Response
"The Navy's emphasis on posting vessel lookouts as the primary operational means of avoiding marine mammal impacts is insufficient. Marine mammals are difficult to detect visually--even by trained observers. The probability of detecting marine mammals at night and in periods of inclement weather is even lower. Greater emphasis should be placed on real-time passive acoustic detection and visual detection of marine mammals by air prior to onset of USWTR activities."	Please refer to Subchapter 6.1.2.2. Lookouts will use different techniques, including night lookout techniques, during periods of low light. Passive sonar, using all capable range instrumentation, and aerial monitoring would be used during all ASW exercises to detect the presence of marine mammals.
"The right whale-specific vessel mitigation measures in the DEIS/OEIS would apply only to the Southeast U.S. critical habitat and an adjacent 5 NM-wide 'associated area of concern.' Right whales inhabit a much larger area than this. Research has shown that right whales utilize most waters within 30 nautical miles of the Georgia and northeast Florida. As stated above, right whales may also utilize waters beyond 30 NM of shore; further research is needed to address this question. Right whale-specific mitigation measures should apply to all areas inhabited by right whales--not just the currently delineated Southeast U.S. critical habitat."	The specific mitigation measures for USWTR will be developed in coordination and in consultation with National Marine Fisheries Service.
"Navy vessels should travel at 10 knots (or minimum safe speed) while transiting through waters inhabited by right whales between November 15 and April 15. Exercises requiring greater vessel speeds should be conducted outside the right whales season or in location where right whales are not present. Contrary to the Navy's contention in the DEIS/OEIS, vessel speed limits are not arbitrary. The best available science indicates that whale mortality and serious injury is significantly reduced at speeds of 10 knots or less."	Navy vessels travel at a slow, safe speed in accordance with the U.S. Coast Guard "Rules of the Road," found at http://www.navcen.uscg.gov/mwv/navrules/rotr_online.htm. Also, Navy follows measures regarding transits as outlined in the 1997 Biological Opinion. The formal consultation with NMFS under Section 7 of the ESA will determine if additional mitigation measures are necessary.

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APPENDIX G

CORRESPONDENCE

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FLORIDA DEPARTMENT OF STATE
Kurt S. Browning
Secretary of State
DIVISION OF HISTORICAL RESOURCES

Naval Facilities Engineering Command, Atlantic
Code EV22LL (USWTR OEIS/EIS Project Manager)
6506 Hampton Boulevard
Norfolk, Virginia 23508-1278

June 3, 2009

RE: DHR Project File No.: 2009-2835
5090 - Ser N4/N7/118
Department of the Navy – U.S. Fleet Forces Command
Final Overseas Environmental Impact Statement/Environmental Impact Statement
Undersea Warfare Training Range
Naval Station Mayport, Duval County

Dear Sir or Madam:

Our office reviewed the referenced project for possible impacts to historic properties listed, or eligible for listing, in the National Register of Historic Places, or otherwise of historical, architectural or archaeological significance. The review was conducted in accordance with Section 106 of the National Historic Preservation Act of 1966, as amended, and 36 CFR Part 800: Protection of Historic Properties and the implementing state regulations.

Based on the information provided, it is the opinion of this office that the proposed undertaking will likely have no adverse effect on historic properties. However, we cannot make a final determination of undertaking effects until we receive and review a copy(ies) of the hydrographic surveys of the trunk cable corridor and range area. We look forward to receipt of these documents.

If you have any questions concerning our comments, please contact Samantha Earnest, Historic Preservationist, by electronic mail *swearnest@dos.state.fl.us*, or at 850-245-6333 or 800-847-7278.

Sincerely,

Frederick P. Gaske, Director, and
State Historic Preservation Officer

500 S. Bronough Street • Tallahassee, FL 32399-0250 • http://www.flheritage.com

❐ **Director's Office** (850) 245-6300 • FAX: 245-6436
❐ **Archaeological Research** (850) 245-6444 • FAX: 245-6452
☒ **Historic Preservation** (850) 245-6333 • FAX: 245-6437

DEPARTMENT OF THE NAVY
COMMANDER
U.S. FLEET FORCES COMMAND
1562 MITSCHER AVENUE SUITE 250
NORFOLK, VA 23551-2487

5090
Ser N4/N7/118
May 14, 2009

Mr. Frederick Gaske, Director
Office of Historical & Cultural Programs
500 South Bronough Street
Tallahassee, FL 32399-0250

Dear Mr. Gaske:

The U.S. Navy is preparing a Final Overseas Environmental Impact Statement (OEIS)/EIS to assess the potential environmental impacts over a ten-year planning horizon associated with the instrumentation of a 1,713-square-kilometer (km^2) (500 square nautical mile [NM^2]) area of the ocean with undersea cables and sensor nodes, and to use the area for anti-submarine warfare (ASW) training. The landward edge of the Undersea Warfare Training Range (USWTR) would be located approximately 93 km (50 NM) offshore of northeastern Florida. A trunk cable connecting the range to a shore facility at Naval Station (NAVSTA) Mayport would be buried to a depth of approximately 0.3 to 0.9 meters (1 to 3 feet). The purpose of the USWTR is to enable the U.S. Navy to train effectively with mid-frequency active sonar in littoral conditions supporting the requirements of the Fleet Readiness Training Plan, and in a location suitable for Atlantic Fleet ASW capable units. Enclosed is a CD-ROM of the USWTR pre-release Final OEIS/EIS. Note that this document is not for public release at this time.

The OEIS/EIS identifies two shipwrecks within the proposed USWTR range boundaries and additional shipwrecks in the area between the proposed range and the shore. A detailed description of the training proposed in this area is also presented in the OEIS/EIS. In December 2008, a hydrographic survey of the seafloor was undertaken on the proposed trunk cable corridor between the range site and the landfall site at NAVSTA Mayport. While the data collected on that trip is still being processed, and the report is not complete, surveyors present on the study vessel indicate that no shipwrecks or other obvious submerged cultural resources were found to be present within the area proposed for installation of the trunk cable. A similar survey is slated to begin on the range area later this year. Information obtained during these surveys is intended to assist the U.S. Navy in avoiding cultural resources in the installation of the range cables and nodes. The results of both of these surveys will be provided to your office once they are completed.

Once operational, it is possible that expended materials such as sonobuoys, torpedo control wires, and flex hoses, would fall onto submerged cultural resources, such as shipwrecks, within the range. However, it is anticipated that these expended materials would not likely damage the physical character of the cultural resources or affect the historic properties of these sites.

Based on the results of the enclosed OEIS/EIS, and pursuant to the requirements set forth in Section 106 of the National Historic Preservation Act (16 U.S. Code § 470(f)), the U.S. Navy has made the determination that no historic properties would be affected by the installation of the USWTR and no historic properties would be adversely affected by the operation of the USWTR. Your concurrence with this assessment will be presumed if a response is not received by the U.S. Navy (Atlantic Fleet) within 30 days from receipt of this determination. Your response should be sent to: Naval Facilities Engineering Command (NAVFAC), Atlantic, ATTN: Code EV22LL (USWTR OEIS/EIS Project Manager), 6506 Hampton Boulevard, Norfolk, VA 23508-1278; or Facsimile (757) 322-4894. If you have any questions, please contact Ms. Lesley Leonard of NAVFAC Atlantic, (757) 322-4645.

Sincerely,

D. F. BAUCOM
Assistant Deputy Chief of Staff
for Fleet Readiness and Training

Enclosure: CD-ROM of USWTR pre-release Final OEIS/EIS

Florida Department of Environmental Protection

Marjory Stoneman Douglas Building
3900 Commonwealth Boulevard
Tallahassee, Florida 32399-3000

Charlie Crist
Governor

Jeff Kottkamp
Lt. Governor

Michael W. Sole
Secretary

May 12, 2009

Ms. Lesley Leonard
Naval Facilities Engineering Command, Atlantic
Code EV22 (USWTR OEIS/EIS Project Manager)
6506 Hampton Blvd
Norfolk, VA 23508-1278

Dear Ms. Leonard:

The Florida Department of Environmental Protection (Department), designated as the state's lead coastal management agency, pursuant to section 306 (c) of the Coastal Zone Management Act (16 U.S.C. 1456 (c)), and Section 380.22. Florida Statutes is coordinating a review of the Department of the Navy's (DoN) pre-release final Environmental Impact Statement (PRFEIS) and accompanying Coastal Zone Management Act Consistency Determination (CD) for the Undersea Warfare Training Range (USWTR). USWTR is proposed to be located about 50 NM offshore Jacksonville, FL and will consist of approximately 500 square NM of undersea cables and sensor nodes for use in anti-submarine warfare training.

While Florida does not object to the proposed USWTR, several issues previously identified in the state's comments on the draft Environmental Impact Statement (DEIS) have not been addressed. The State's November 4, 2008 comment letter (enclosed) identified the information necessary to complete the consistency review of the USWTR proposal. The CD provided to the Department with the PRFEIS only addresses the state waters portion of the proposed project. As discussed in the state's letter, the entire project, especially that portion proposed in federal waters, has the potential to affect Florida's coastal and marine resources. The entire project, therefore, should be evaluated in the consistency determination [15 CFR 930.11(g)] and supported by sufficient, comprehensive data and information as specified in 15 CFR 930.39.

Of great concern to the state, is the location of the proposed USWTR which surrounds the North Florida Marine Protected Area (MPA). The MPA was created by the South Atlantic Fisheries Management Council to protect important and valuable fisheries and fishery habitat found there. In addition, the proposed USWTR area is in close proximity to another critical habitat area, the East Florida *Lophelia* reefs, which is being considered for designation as a Habitat Area of Particular Concern (HAPC) because it is in habited by extensive deepwater corals. Both of these areas are considered important habitat for several commercially important fisheries off of southeastern U.S. and are used by fisheries and other marine fauna that traverse between federal and state water boundaries.

The state also requested more detailed information regarding marine debris, especially parachutes that will be used and discarded during the training exercises, as well as construction methodologies proposed to be used. Also, until benthic habitat surveys are completed, the effects of the USWTR proposal on important habitats cannot be determined. As discussed in the November 4th letter, the state will need to review and analyze the habitat surveys of the proposed project area before consistency of the proposal can be determined.

The Florida Fish and Wildlife Conservation Commission also noted some information in the PRDEIS that was incomplete regarding their concerns identified in the November 4th letter. Please refer to the attached email.

Florida also noted that the state waters portion of the project, depending on construction methodology, may require an Environmental Resource Permit under Chapter 373 Part IV, F.S. from the Department's Northeast District Office. The trunk line will also require an easement for use of sovereign submerged lands.

Pursuant to section 307 of the Coastal Zone Management Act and implementing regulations at 15 CFR 930, CDs should include a detailed description of the project, its associated facilities, and its effects. Since the entire project has the potential to affect state coastal and marine resources, the CD accompanying the PRFEIS is incomplete. Upon receipt of a CD for the entire proposal and the necessary supporting information, the state will commence the review period allotted in 15 CFR 930.41

We appreciate the opportunity to review the proposed USWTR. Should you have any questions, please contact Ms. Shana Kinsey or Ms. Debby Tucker at (850)-245-2163.

Cordially,

Lynn Griffin

Lynn Griffin
Coastal Program Administrator
Office of Intergovernmental Programs

LG/sk
enclosures

cc: Jennifer Fitzwater, FL DEP
Mollie Palmer, FL DEP
MaryAnn Poole, FFWCC
Mike Eaton, FL DEP, NE District
Bernice Snyder, Department of the Navy
Jene Nissen, Department of the Navy

Kinsey, Shana

From: Poole, MaryAnn [MaryAnn.Poole@MyFWC.com]
Sent: Monday, May 11, 2009 4:22 PM
To: Kinsey, Shana
Cc: Ward, Leslie; Pitchford, Tom; Knox, Carol; Duncan, Mary; Chabre, Jane
Subject: RE: USWTR outstanding questions

Importance: High

Shana –
These are the main outstanding issues that our staff had on this project. If some of them cannot be answered because of Homeland Security concerns, would it be possible to have them let us know that this is the situation so we understand why some of our questions originally raised were not addressed?

Thanks!

From: Duncan, Mary
Sent: Monday, May 11, 2009 4:15 PM
To: Poole, MaryAnn
Cc: Ward, Leslie; Pitchford, Tom; Knox, Carol
Subject: USWTR outstanding questions

In our October 20, 2008 letter, # 3 under recommended mitigation measures, we stated that the "DEIS did not provide specifications, such as altitude, spatial or temporal extent, etc., for the aerial surveys that they propose to conduct prior to commencement of warfare excerises'. Specifications have still not been provided, they only added that helicopters would observe the vicinity ten minutes prior to the dipping of sonobuoys.

The answers for the following concerns, including 1) ceasing activity if strandings occur until an investigation is done and 2) not limiting mitigation measures to critical habitat, were answered by stating that the Navy has developed their 'stranding response plan' with NMFS. This plan, however, does not appear to be incorporated into the FEIS. Please clarify the intent to accept or reject these recommended mitigation measures.

The answer for the concern regarding the reduction in vessel speeds to below 15 to 17 knots, particularly during calving season or during night time activities, were answered by stating that the NMFS exempts military vessels due to other mitigating measures. Please clarify why the Navy would not voluntarily observe the NMFS rule in this important whale habitat, when the other mitigating measures are not as effective during calving season or night time activities.

Section 6.2.2 in the FEIS states that whale sightings would be reported to Fleet Area Control and Surveillance Facility, and Section 6.6 states that reporting sightings would adversely impact the effectiveness of the military readiness activity. Please clarify whether or not sightings will be reported to the Fleet Area Control and Surveillance Facility, and if so, why these reports cannot be forwarded on to become part of the Early Warning System (EWS).

Mary Duncan
Imperiled Species Management Section
Florida Fish and Wildlife Conservation Commission
850-922-4330

Florida Department of Environmental Protection

Marjory Stoneman Douglas Building
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Charlie Crist
Governor

Jeff Kottkamp
Lt. Governor

Michael W. Sole
Secretary

November 4, 2008

Naval Facilities Engineering Command, Atlantic
Code EV22LL (USWTR OEIS/EIS PM)
6506 Hampton Boulevard
Norfolk, VA 23508-1278

RE: U.S. Department of the Navy – Draft Overseas Environmental Impact Statement/Environmental Impact Statement for the Undersea Warfare Training Range, Atlantic Ocean
SAI # FL200809154433C

Dear Commander:

Pursuant to Section 403.061(40), *Florida Statutes*, the Florida Department of Environmental Protection (Department) has coordinated the State of Florida's review of the U.S. Department of the Navy (DoN) Draft Environmental Impact Statement (DEIS) for the proposed Undersea Warfare Training Range (USWTR). The DoN proposes to establish a 500-square nautical mile underwater sonar range approximately 50 nautical miles off of Jacksonville, Florida for anti submarine warfare training. DoN personnel will be trained to use sonar to locate submarines, particularly the quiet diesel submarines in use today.

The underwater range would consist of a grid of approximately 300 underwater transducer nodes connected by commercial fiber optic undersea cable. The transducer nodes would be capable of both transmitting and receiving acoustic signals. The sound source levels and sound frequency ranges to be produced at USWTR during training activities would reach levels that could cause temporary threshold hearing shifts and behavior changes in some marine animals. The training range grid will be connected to onshore facilities in Naval Station Mayport via a single 51-nautical mile buried trunk cable.

Each training event would involve up to three vessels and two aircraft. As many as 470 training events of 6-24 hours per event could take place each year. Other training activities may involve non-explosive exercise weapons and related devices (sonobuoys, target submarine simulators), some of which would remain in place and not be recovered.

The State of Florida recognizes the importance of the proposed USWTR, but does not find the DEIS to have fully addressed the environmental consequences of installing the infrastructure and conducting training operations over the long term. The area of the proposed range is occupied by diverse biological communities, fisheries, and marine mammals and includes a Marine Protected Area (MPA) designated to protect prime grouper-snapper habitat. Both the state and federal government protect and manage coastal ecosystems, fisheries and marine fauna, making it important to design and conduct a project that results in minimal short and long term environmental disturbance.

While the DEIS contains some preliminary information needed to evaluate environmental effects, the project description is conceptual and the description of the affected environment is very general and not based on surveys or site-specific data collection. Therefore, no conclusive analyses of the effects of installing the grid or the long term use of the area can be made based on the information provided. The following comments outline some information that was either not included or incomplete in the DEIS, and that is necessary for a substantive review of the project. Additional detailed comments on the DEIS from Department staff and the Florida Fish and Wildlife Conservation Commission (FWC) are attached.

Project Description

The DEIS presents a project concept and general maps, but should provide diagrams or maps of cable routes and sonar nodes in relation to benthic resources, artificial reefs, fisheries habitat, etc. More information on installation methodologies is required. For example, the cable burial vehicle is described as having a width of 16 ft., but the DEIS does not clarify whether that equates to a 16-ft. impact swath along the entire estimated 600 nautical miles of cable to be installed. In addition, there are no maps showing precisely where the trunk cable will come on shore. Although the trunk cable is only 2.5 inches in diameter, the DEIS mentions that it will be installed via directional drilling, but does not provide details on the extent of disturbance related to its installation.

Resource Impacts

The DEIS should include detailed maps depicting the locations of benthic resources in relation to proposed structures and cables. Benthic resource information should be obtained from biological and photographic surveys using protocols sufficient to allow the types and areal extent of affected resources and ecosystems, especially those that may be unique to the area, to be quantified and mapped. Enclosed is a copy of the Department's recommended guidelines for conducting offshore surveys and the preferred method of presenting marine resource data and information for evaluation.

The DEIS should examine and quantify all permanent, temporary and secondary impacts to habitats, especially the acreage of live and hardbottom to be eliminated or disturbed by installation of the cable grid and the long term effects of USWTR training activities. The DEIS should describe how these impacts will be avoided or minimized. Resource impact evaluations and project alternatives should be based on complete descriptions of all aspects of the proposed activities, including alignment and construction options.

Artificial Reefs, Fisheries and Marine Mammals

Enclosed letters from the FWC include recommendations regarding the proposed project and mitigation measures to increase protections for marine mammals in the proposed project area. Since the calving grounds for the North Atlantic right whale (*Eubalaena glacialis*) are off the coasts of Georgia and Florida, the FWC has concerns regarding the possible severe impacts to this endangered species. The FWC also has expressed concerns about the effects of bottom modifications on artificial reefs, essential fish habitat, and the North Florida MPA, which covers approximately 20% of the proposed USWTR area.

Mitigation

A discussion of mitigation for unavoidable impacts to resources should be included in the DEIS and address impacts to all marine resources, not only marine mammals, resulting from the installation and operational use of the established training area. In particular, the DEIS should evaluate the need for mitigation of any potential long-term effects of operational waste materials left on the seafloor ecosystem.

Pursuant to section 307 of the Coastal Zone Management Act, the DoN provided the state with a draft determination of consistency with the Florida Coastal Management Program; however, the determination only included a discussion of the trunk cable installation through state waters. The entire project has the potential to affect state coastal and marine resources and, therefore, should be evaluated in the consistency determination and supported by sufficient, comprehensive data and information as specified in 15 CFR 930.39. The federal regulations provide for consistency determinations to include a detailed description of the project, its associated facilities, and its effects. The information needed for the EIS effects analysis identified in this letter and attachments is also necessary to support the coastal management consistency determination. Upon receipt of the consistency determination and the necessary supporting information, the state will commence the review period allotted in 15 CFR 930.41.

Depending on the construction methodology to be used, the state-waters portion of the project may require an Environmental Resource Permit under Part IV of Chapter 373, *Florida Statutes*. The trunk line will also require an easement for the use of sovereignty submerged lands.

Because the EIS and the consistency review are based on the same information and being conducted in the same general timeframe, it is recommended that the EIS, Coastal Zone Management Act, and regulatory reviews be closely coordinated and synchronized. State agency and coastal management program staff are available to facilitate the review of the project and to ensure timely decisions.

We appreciate the opportunity to provide comments on the DEIS for the proposed USWTR. Should you have any questions, please contact Ms. Shana Kinsey or Ms. Debby Tucker at (850) 245-2163.

Cordially,

Lynn Griffin
Coastal Program Administrator
Office of Intergovernmental Programs

LG/sk
enclosures

cc: Jennifer Fitzwater, FDEP
Mollie Palmer, FDEP
Jene Nissen, Department of the Navy
Bernice Snyder, Department of the Navy
Mary Ann Poole, FWC
Lisa Gregg, FWC
Carol Knox, FWC
Keith Mille, FWC
Beth Weatherford, FDEP, NE District
Mike Eaton, FDEP, NE District

Dept of Navy Undersea Warfare Training Range (USWTR)
Draft Environmental Impact Statement
Florida Department of Environmental Protection Comments
October 29, 2008

Page S-5, Section ES.4.1.2: Will other types of exercises be conducted on the USWTR besides the Anti-submarine Warfare (ASW). If so, please explain.

Page S-6, Table ES-1: From the table presented, it appears that the USWTR will have almost constant use. Was this accounted for when analyzing the possible effects on coastal and marine resources? Will this significantly increase the amount of ship traffic coming out of Jacksonville on a daily basis, if so, how much? Could this increased traffic affect the areas of known North Atlantic right whale habitat?

Page S-9, Section ES.5.1: It is stated that materials left in place are not expected to result in any significant degradation of the environment. Please provide MSDS sheets on all materials expected to be expendable and references to support the statement.

Page S-10, Section ES.5.2: Although the material left in place may not pose a hazard as it decomposes, could accidental ingestion occur? What is the likely hood that these materials may resemble food sources for ESA species?

Page S-15, Section ES.5.4: Please explain why part of the proposed project is located in international waters? Why was the Exclusive Economic Zone (EEZ) not included in the analysis of the proposed project's boundaries?

The next to last paragraph stated the Navy could issue notice to mariners, advising of potentially hazardous operations, but the next paragraph states that the USWTR operations would have to avoid shipping vessels transiting through the range. Please explain.

How many notices to mariners would be issued each year? At the open house, it was suggested that recreational and commercial fishing does occur in the proposed project area. Would this notice exclude recreational and commercial fishermen from using the area?

Page 1-13, Section 1.5.1: Please explain the determination that some impacts are outside US territory? Why was the Exclusive Economic Zone (EEZ) not included in analyzing the location of impacts?

Please explain why NEPA analysis is not applied to waters out from the state-federal boundary to the EEZ.

Page 2-6, Section 2.2.1: Please completely describe the construction methods that will be used to bring the trunk cable onshore at Mayport Naval Station?

When will the decision be made that the trunk cable or interconnect cables should be buried or not? If it is to be buried, and the local bottom type is too hard to cut, what burial alternatives are available?

Page 2-50, Section 2.5: This section states that directional drilling techniques will be used to bring the trunk cable on shore. Please describe the directional drilling process, in detail. Where exit/entrance pits will be located; how drilling fluids will be handled; the possibility frac outs including the procedures that will be used to minimize and respond to frac outs.

Please explain the term deadman anchor.

Please provide a more detailed description including diagrams of the remotely operated cable burial vehicle. Please provide a more detailed description of the anticipated impacts to benthic habitats due to using the cable burial vehicle. Since the burial vehicle is approximately 16 ft in width, how will impacts to possible sensitive benthic habitat be avoided during construction of the proposed project? Please discuss if there are any other alternative construction methods to the cable burial vehicle.

Page 3.1-3, Section 3.1.1.1: The information presented represents only about 20% of the proposed site A. In meetings with the DoN, it was relayed to the state that surveys of the area were being planned. The methodology, data, and analysis from those surveys should be included in the Final EIS. Along with the sonar range, the entire run of the trunk cable should also be surveyed and analyzed.

Page 3.2-2, Section 3.2.2.1: Please provide the state with copies of the reference DoN 2007d (Marine Resource Assessment for the Charleston/Jacksonville Operating Area).

Page 3.2-18, Section 3.2.4: The state recommends adjusting the boundaries of the proposed range, so the recently designated MPA would not be within the proposed range.

Page 3.2-20, Section 3.2.4.1: Bottom habitats in the entire range and corridor at Site A should be surveyed and analyzed for habitat types. Information collected should be forwarded to the state for review and should include maps and figures showing the designated habitats overlaid with the proposed project alignment (cable placement, sonar node placement, and impacts expected from construction and usage).

Page 3.7-1, Section 3.7.1: Information presented here in incorrect and should be updated. The Florida Coastal Management Program (FCMP) is coordinated by the Florida Department of Environmental Protection (DEP) and is the lead coastal agency pursuant to Sections 380.22(1) and 403.061(40), *Florida Statues*. The FCMP was moved from Florida Department of Community Affairs to DEP in 2002. The state's federal consistency review is specified in Section 380.23, *Florida Statutes*.

Page 4.1-3, Section 4.1.1.1: The third paragraph states that hard bottom ledges and biogenic reef mounds are unlikely to be impacted because of difficulty of using burial equipment in areas where these resources occur. Will these areas be avoided when laying the grid? If so, please explain how these areas will be avoided. If avoidance is not possible, please describe how impacts will be minimized. If the transmission cable cannot be buried, how will it be secured to the substrate to ensure no movement will occur?

If the ocean bottom burial equipment cannot cut the hard bottom, what other alternative methods of installation will be used?

What type of turbidity plumes are expected with the use of the bottom burial equipment? How long will the plumes last, what resources could be affected from the burial equipment?

Should surveys reveal deepwater corals present in the area of the proposed project, please describe what procedures that will be used to avoid and minimize impact to these resources. Deep water corals and livebottom habitats are a valuable resource providing habitats including EFH that are slow to recover from impacts.

Page 4.1-4, Section 4.1.1.1: Deepwater corals tend grow very slowly and inhabit areas with specific requirements. Please provide references supporting the idea deepwater corals would recolonize the disturbed area created by the construction of the sonar range.

Page 4.1-4, Section 4.1.1.2: What impact will the expendable materials from torpedoes that do not degrade have on the surrounding habitat? Is there possibility for entanglement or ingestion by fish, mammals, or turtles?

Please provide reference that the non-inert materials would degrade, corrode, and become incorporated into the sediments. What is the timeframe for incorporation into the sediments?

Page 4.1-6, Section 4.1.1.3: Please provide references that the sonobuoys would degrade, corrode, and become incorporated into the sediments over time. What is the timeframe for incorporation into the sediments?

Page 4.1-9, Section 4.1.1.3: Please provide references that the targets or EMATTs would degrade, corrode and become incorporated into the sediments. How many years would this process take?

Page 4.1-7, Section 4.1.1.3: Please provide references for the battery study of the Aid to Navigation sites in California. Please provide references for the prototype investigations.

Page 4.2-5, Section 4.2.3.1: Please provide tables detailing the impacts to resources.

Page 4.2-6, Section 4.2.3.1: While unburied transducers may provide substrate for some organisms, artificial hard substrate does not have the same replacement value as natural hardbottom.

Page 4.2-8, Section 4.2.3.1: Are seagrasses expected in the nearshore area of the proposed project? If so, will surveys be done to determine the extent of the resource? Describe how impacts will be avoided. Please provide the state with a copy of the reference DoN, 2008a (EIS/OEIS Undersea Warfare Training Range, Essential Fish Habitat. Technical Report. [2008 Revision of (Department of the Navy 2007a)]).

The state recommends shifting the boundaries of the proposed project so that the North Florida MPA would not be within the proposed project site A.

Page 4.2-19, Section 4.2.3.2: Artificial hard substrate does not replace the value or function of a natural hardbottom.

Section 4.2.3: Please discuss if expendable materials such as wires could potentially physically impact benthic resources found within the biogenic reef community including deepwater corals. Is there a potential for the wires to wrap around organisms/benthic habitat and cause persistent abrasion damage?

The DEIS should include a discussion of the impact parachutes that are considered expendable and will not be recovered on benthic resources. Please discuss the impact these parachutes will have on benthic resources (smothering, entangling, etc.). What sizes are the parachutes that will be used in the project area? How long are these parachutes expected to be present before degrading? Could these parachutes be constructed of biodegradable material, so as to minimize possible impacts?

Section 4.2.4: Are there any anticipated impacts from ingestion of any of the materials that are considered expendable. The only discussion of ingestion concerned the parachutes. Is there a possibility of accidental ingestion of the other expendable materials (wires, flex hoses, ect) by sea turtles and/or marine mammals?

Page 4.2-23, Section 4.2.4.2: How long will the control wires from the Mk 48 EXTORP? What is the entanglement possibility for EFH and corals from the control wires? See previous comment.

Page 4.2-25: Please discuss if the expendable flex hoses could pose either an entanglement issue or a continuous impact problem for EFH and/or corals present in the proposed project area.

Page 4.8-29, Section 4.8.4.2.1: This section should be updated to include the two LNG projects off of Ft. Lauderdale, FL: proposed Calypso Deepwater Port and AES LNG Pipeline.

Section 4.8.5: Once habitat surveys are concluded cumulative effects should be reanalyzed. There is such limited data on the benthic habitat of the proposed area that a valid conclusion may not be possible without the additional data being included. In order to properly evaluate cumulative impacts, complete data for benthic resource impacts is needed.

Section 6: There is no discussion of mitigation measures for impacts to benthic resources. Please detail measures that will be utilized to mitigate impacts to benthic resources.

Page 6-25, Section 6.5: Please describe avoidance and mitigation procedures to be used when training exercises are conducted in low-visibility or at night? Could the night training be curtailed or altered if it is determined that marine mammals are present in the range during certain times of the year?

Page 6-27, Section 6.5: According to previous text, if a marine mammal is spotted in the area of the exercises there are procedures in place to offset any potential impact to the animal. Would this information be noted in a record for the training maneuvers? If so, could the information regarding the animal(s) be relayed to the scientific community after the maneuvers are completed and analyzed?

Guidelines for Conducting Offshore Benthic Surveys
DEP Office of Intergovernmental Programs Offshore Projects Section
Updated March 2006

The intent of these guidelines is to provide applicants with a general description of the information necessary to accurately assess the impacts of projects proposed offshore of Florida. Because each project and its resulting impacts to resources may differ, necessary project-specific information or methods for collecting information may vary. The Department encourages applicants to work with staff in the early stages of project development to ensure that adequate information is collected and analyzed in reports. This will help to facilitate efficient and timely reviews by the state and avoid the necessity of conducting additional surveys.

Background
Live-bottom habitats are the foundation of the marine ecosystem of the Florida shelf, supporting fisheries, marine fauna and recreational activities. Hard or rocky live-bottom is especially important because its structure provides a stable substrate on which biological communities flourish, thereby attracting associated organisms. These habitats and their associated communities generally occur in clear, clean waters and contribute to the maintenance of water quality. Federal law describes this resource as "Essential Fish Habitat" for many marine species, including those found in Florida waters.

The potential for impacts to these important habitats in coastal and offshore waters is a major concern of the state. Avoiding impact to these communities is the preferred way to protect them. If avoidance is not possible, then actions that minimize impacts are required. As a last resort, where impacts to habitat cannot be avoided, mitigation is necessary.

General
Surveys conducted in both state and federal offshore waters should provide complete geophysical and biological characterization of the seabed and associated benthic communities potentially affected by installation and operational activities. Survey protocols should incorporate, as appropriate, the Minerals Management Service's requirements for outer continental shelf oil and gas exploration/development under 30 CFR 250 and described in detail in Notices to Lessees **(1)** No. 2005-G07, Archeological Resource Surveys and Reports; **(2)** No. 98-20 Shallow Hazards Requirements; **(3)** No. 2004-G05, Biologically Sensitive Areas of the Gulf of Mexico (see especially Live bottom Low Relief Features); and **(4)** No. 2003-G17, Guidelines for Submitting Exploration Plans and Development Operations Coordination Documents. The following guidelines are derived from these sources, previous experience, the requirements of the state of Florida's federal consistency review and some elements of the environmental resource permit review.

The footprint of the project includes all areas directly affected by the project, such as: bottom areas contacted by structures, anchors, cables; the construction swath for pipeline entrenchment; and associated impacts occurring in adjacent areas due to bottom disturbance, sedimentation, and anchor placement and cable sweep of pipelay barges and support vessels. In cases where project footprint details are not yet known (e.g., installation methodology has not been determined) surveys should cover the area corresponding to the project design with the greatest areal impacts (i.e., worst-case). The state encourages the use of construction methodologies that minimize benthic and water column impacts. Should significant live/hard-bottom communities be encountered at a preferred site or along a preferred route, alternative locations should be surveyed.

Companies may wish to consider using a phased approach, beginning with qualitative video reconnaissance surveys to scope broad areas and eliminate unsatisfactory locations, followed by more detailed qualitative and quantitative investigations at preferred locations. Ongoing consultation with state and federal resource agencies throughout this process will ensure a final site location that fully minimizes impacts to resources.

Geophysical
Survey components include: bathymetry (multibeam quality); high-resolution side scan sonar; subbottom profiling; cores; magnetometer; surficial sediment quality, percent fines and grain size analysis. Collectively, the information from these surveys should provide complete geophysical characterizations of the surface and subsurface geology in the areas affected by the project. Core and sediment samples should be of sufficient number and distribution to allow statistically reliable and valid interpretations throughout the area affected by the project.

All geophysical information should be displayed on a detailed map at an appropriate scale showing the preferred project location, alternative locations and routes surveyed, and the related construction impact zones. A depiction of the subbottom trace should be displayed adjacent to the plan view, at the same scale. The locations of all geologic and photographic sampling stations should be indicated on the map. Because it provides highly useful comparative information, a composite map that displays the interpreted geological and biological information together is required. All maps should display geographic coordinates and fix points so that locations in the survey area can be easily associated with photographic information.

Biological
Biological surveys include precise mapping and characterization of benthic habitats using high-resolution video photography and color still photography taken close to the seafloor in areas which will be directly (e.g., anchoring, trenching) or indirectly (e.g., sedimentation) impacted by the proposed project. Video and still photography together should allow not only presence/absence mapping of habitats and communities by type, but also quantitative interpretations of species composition and densities. Accurate benthic characterization should include a description of sediment types, organisms identified to the lowest practicable taxonomic level (species if possible) and percent cover of identified species. The number and spacing of video tracks should be sufficient to provide accurate documentation of the presence/absence and general characterization of each habitat/community type encountered. For linear projects, complete video surveys should be conducted from the shoreline to at least a depth of 200m. Video surveys beyond 200m may be necessary for all types of projects where geophysical data indicate hard/live bottom may exist. Where significant live/hard-bottom areas are found, the video record should be augmented with additional tracks, extending outward from the center line in the proper direction and in sufficient numbers to accurately document the full extent of the trend. In shallow waters, photographic surveys may be collected by divers. For those surveys

conducted from a vessel, all videos should be operated with a surface monitor and recorder, preferably with an audio track on which navigation fix points are indicated. Regardless of the collection method, videos should also be annotated with date, time, and geographic coordinates (state plane or lat/long) that are clearly legible on the video monitor. Graphic coordinate annotations should also be depicted on project maps so that features on the map can be easily located and inspected on the video record. Video surveys should be conducted under the proper conditions of tow speed, water clarity and height above the bottom to enhance the reviewers' ability to determine presence/absence and characterize the communities present.

Qualitative and quantitative still photographs should be taken throughout the survey area, illustrating typical assemblages and densities of all epibenthic habitats encountered. Quantitative photography stations should be located in representative depth ranges and epibenthic habitat types. It is anticipated that a minimum of 100 quantitative photographs will be necessary to provide sufficient data for the proper characterization of each benthic community type. Quantitative assessments should be based on species counts obtained by analyzing a statistically sufficient number of photographs encompassing a standard surface area (e.g., 0.5 meter squared) at each habitat being surveyed. Quantitative and qualitative photos should be taken from a camera with surface control capability that is mounted with the video camera.

Reports
Using photographic and geophysical information collected in the surveys, maps should be prepared displaying the areal extent of all habitat types overlaid with geophysical information, including bathymetry with isobaths at appropriate intervals (e.g., 1, 2, or 5 meters), and geographic coordinates. A benthic habitat survey report should be prepared to describe in detail the survey and sampling methodologies used to produce the maps. The report should include species lists and the results of the quantitative assessment of species composition and density in live-bottom areas. Using the video and still photography, both soft (sand veneer) and hard/live bottom communities should be characterized. Habitat assessments should describe the geologic conditions, such as relief and substrate characteristics, associated with each habitat type. The report should also include a discussion of published and unpublished literature describing benthic communities, both hard and soft bottoms, on the Florida shelf and a comparison of survey results with information found in the literature.

The report should also quantify the potential acreage of each substrate and habitat type that would be directly and indirectly impacted by the proposed project. These estimates should account for a range of construction options if the precise method of construction, installation, anchor handling, etc. is not known.

Electronic Submission of Geophysical and Biological Data
Geophysical and biological data should be submitted on CD to the Department in either AutoCad or Arc compatible forms. Data should be recorded using the following formats:

All location data in decimal degrees to 6 places.
Longitude expressed as a decimal (regardless of coordinate system)
Longitude field name: lon_dd
Latitude field name: lat_dd

Projections:
Here is an example to UTM Zone 17N
NAD_1983_UTM-Zone17N
Projection: Transverse_Mercator
Parameters:
False_Easting: 500000.000000
False_Northing: 0.000000
Central_Meridian: -81.000000
Scale_Factor: 0.999600
Latitude_Of_Origin: 0.000000
Linear Unit: Meter (1.000000)
Geographic Coordinate System:
Name: GCS_North_American_1983
Angular Unit: Degree (0.017453292519943295)
Prime Meridian: Greenwich (0.000000000000000000)
Datum: D_North_American_1983
Spheroid: GRS_1980
Semimajor Axis: 6378137.000000000000000000
Semiminor Axis: 6356752.314140356100000000
Inverse Flattening: 298.257222101000020000

If Albers projection is used:
False_Easting: 400000.000000
False_Northing: 0.000000
Central_Meridian: -84.000000
Standard_Parallel_1: 24.000000
Standard_Parallel_2: 31.500000
Latitude_Of_Origin: 24.000000
GCS_North_American_1983
Datum: D_North_American_1983
Prime Meridian: 0

Florida Fish and Wildlife Conservation Commission

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October 20, 2008

Lauren Milligan
Florida State Clearinghouse
Florida Department of Environmental Protection
3900 Commonwealth Boulevard, Mail Station 47
Tallahassee, FL 32399-3000

Re: SAI #FL200809154433C, Duval Co., Draft Overseas Environmental Impact Statement/Environmental Impact Statement, Undersea Warfare Training Range, Atlantic Ocean

Dear Ms. Milligan:

The Florida Fish and Wildlife Conservation Commission (FWC) offers the following comments on the Draft Environmental Impact Statement/Environmental Impact Statement (DEIS) for the Department of the Navy's proposed Undersea Warfare Training Range (USWTR) in response to the request for review posted on your website, http://projects.earthtech.com/uswtr .

Project Description

The Navy is proposing to construct an Undersea Warfare Training Range (USWTR). The purpose of the site is to train Navy personnel in the use of sonar in shallow environments to locate submarines, particularly quiet diesel submarines in use today. Existing training sites are located in deepwater environments, whereas typical wartime scenarios are often in shallow waters. Training in deep-water environments does not adequately prepare personnel for coastal scenarios because propagation of sound differs greatly between the two environments. Currently there are four proposed sites, with the most favored (Site/Alternative A) located approximately 93 km (50 nautical miles) offshore of northeastern Florida in the Jacksonville Operating Area (OPAREA). The other three sites are offshore of central South Carolina (Charleston OPAREA, Site/Alternative B), offshore of southeastern North Carolina (Cherry Point OPAREA, Site/Alternative C), and offshore of northeastern Virginia (VACAPES OPAREA, Site/Alternative D).

The USWTR project would include instrumentation of a 500-square-nautical-mile area of ocean bottom with undersea cables and sensor nodes. The site would consist of approximately 300 transducer nodes connected to each other by commercial fiber optic undersea cable, and connected to onshore facilities via a single, buried trunk cable. The training would typically involve up to three vessels and two aircraft for any one training event. Up to 470 training events could take place each year. Other materials include non-explosive exercise weapons and other training-related devices (sonobuoys, target submarine simulators, etc.). Forms of active sonar include the SQS-53 AND SQS-56 sonars with nominal source level for training of 235 and 225 dB re 1μPa^2 @ 1 m, respectively. The frequencies involved in the acoustic signals range from 1,000 to 10,000 Hz.

Potentially Affected Resources

All four sites under consideration fall within the geographic range of the North Atlantic right whale (*Eubalaena glacialis*), one of the most endangered large whales in the world, with an estimated population of approximately 350 individuals (Kraus *et al.* 2001). Recent modeling efforts indicate that the loss of as few as two females per year may ensure the extinction of the species (Caswell *et al.* 1999, Fujiwara and Caswell 2001). Due to their high mortality rates, each female right whale must produce at least four calves over its lifetime to replace itself in the population (National Marine Fisheries Service [NMFS] 2008).

North Atlantic right whales migrate south from their feeding grounds in the northeastern U.S. to their calving grounds in Georgia and Florida. The calving grounds are federally designated critical habitat for this species. The proposed USWTR site off the Florida coast (Site A) is very near the critical habitat and calving grounds. Mainly adult females and calves, along with some juveniles and adult males, migrate to the southeastern calving grounds each winter, and may remain in the area for four to five months. Migration from the northeastern feeding grounds typically begins in October, although some individuals may not travel as far south as the southeastern critical habitat. Most right whales have left the calving grounds by April for the return trip to the northern feeding and nursing areas. Migratory patterns are variable, in part because they are subject to variability of weather and climatic influences. Individuals may also venture south outside of their typical feeding areas at other times of the year, such that right whales could be found in the mid-Atlantic during much of the year. For instance, carcasses and entangled whales have been recorded off of the mid-Atlantic region in the summer months.

Although North Atlantic right whales are thought to concentrate within 55 km of the coast on their mid-Atlantic migration (Knowlton *et al.* 2002), sightings do occur beyond this distance from shore. We concur with Hain and Kenney (2005) that uncertainty in predicting right whale occurrence is increased with distance from the shoreline because of reduced search efforts offshore compared to nearshore areas. In the southeastern calving grounds, recent aerial survey efforts have located right whales approximately 70 km from the shoreline. In addition, an entangled whale, equipped with a satellite tag during disentanglement operations, was recorded at approximately 118 km off the Florida shoreline on December 5, 2005. Despite uncertainties, data and anecdotal evidence indicate that right whales can occur at distances greater than 55 km along the eastern seaboard.

Ship strikes are the main source of human-caused mortality in this species (Knowlton and Kraus 2001). From 1991 to 2002, 14 documented North Atlantic right whale mortalities were determined to be the result of ship strikes. More carcasses have been recovered since then, including several reproductive females that had been struck by ships. Recently, the mortality of a right whale calf found off the coast of Jacksonville on January 10, 2006, was attributed to a ship strike. The magnitude of undocumented mortalities is unknown because carcasses may sink before ever being detected.

Vessels navigating between port and any of the proposed USWTR Sites/Alternatives (A, B, C, or D) would contribute to increased vessel traffic along the eastern seaboard, thereby increasing collision risk to right whales during migration. Site A, in northeastern Florida, also increases the risk to right whales in their winter calving grounds. Vessels originating from Mayport Naval Station in Florida and Kings Bay Naval Station in Georgia and transiting to Site A would pass directly through an area where aerial surveys have consistently documented high concentrations of right whales, and the 15- to 17-knot transit speeds cited in the DEIS can be fatal to struck right whales (NMFS 2008).

The winter inhabitants off the coast of Jacksonville (near Site A) consist primarily of females and their calves, the most vulnerable and most important component of the right whale population, both of which must spend more time at the surface due to the calves' undeveloped lung capacity. This characteristic may contribute to the disproportionately high number of females struck by ships (NMFS 2008).

A secondary concern is the noise and other disturbances from low-altitude aircraft (helicopters and fixed wing), which can affect cetaceans, causing short term behavioral changes including startle response and possible separation of mothers and calves (Patenaude *et al.* 2002, Nowacek *et al.* 2004). Altitudes ≤150 meters and lateral distances ≤250 meters have been found to cause behavioral reactions by bowhead whales (*Balaena mysticetus*), a close relative of the right whale. Combined with other cumulative stressors, relatively minor incidents can be harmful. Shore-based training aircraft will pass over critical habitat during transit. While not as potentially harmful as increased collision risk, steps should be taken to minimize aircraft impacts on right whales, especially within the critical habitat.

The training activities within the boundaries of the proposed Site A USWTR and the increase in transiting vessel and aircraft traffic are of concern for all marine mammals but particularly for right whales. The additional noise levels and increased vessel traffic could further jeopardize right whales, a species already at high risk of extinction.

While all four sites are located in areas where right whales could be present, if the project does move forward, we believe the vital importance of the southeastern calving grounds to the persistence of the species renders the Jacksonville OPAREA inappropriate for the USWTR.

Recommendations Regarding Proposed Activities

1. We recognize and support the need for the proposed training for national security; however, based on the endangered status of the right whale and the importance of protecting their habitat along the U.S. eastern coast, our preferred alternative for this project is the "No Action" alternative.

2. Should the USWTR project move forward and one of the four proposed sites is selected, we strongly recommend against Site A (offshore Jacksonville) because of its proximity to the right whale calving grounds and possible negative impacts, including an anticipated increase in traffic through critical habitat.

3. If Site A is ultimately chosen, we recommend that the Navy follows both the proposed Site A mitigation measures specified in the DEIS as well as the additional mitigation measures recommended below.

4. During the project activities, should there be any cetacean strandings that are temporally and spatially coincident with Navy training events, the activity should cease and the Navy should fund a thorough investigation to determine the cause of the strandings. Activities should not resume until the identified cause can be appropriately addressed.

5. All proposed sites should receive an NMFS Section 7 review for potential impacts to right whales as all sites are along the migratory path of right whales moving from their feeding grounds to their calving grounds. Knowledge of spatial and temporal extent of offshore migratory paths is limited, as noted above, although evidence indicates that at least some right whales are found at a distance from shore consistent with USWTR placement. The distance from shore of any of the proposed sites (Charleston OPAREA at 74 km, VACAPES OPAREA at 63 km offshore, Cherry Point OPAREA at 86 km, and Jacksonville OPAREA at 93 km offshore) does not preclude the presence of right whales; therefore, section 7 consultation is prudent for any of the proposed locations of the USWTR.

Recommendations for Mitigation Measures for Impacts to Marine Mammals

1. The DEIS proposes some mitigation measures for all Sites/Alternatives such as posting trained lookouts and maneuvering away from observed whales. It also specifies additional measures specific to Site A to be exercised during right whale calving season. Measures specific to Site A include a notification message sent to all ships prior to calving season regarding North Atlantic right whales, avoiding unnecessary north-south transits within the critical habitat during the calving season, vessels using extreme caution and operating at slow, safe speeds, and limiting training and operations in the critical habitat and consultation area to daylight hours and periods of good visibility. While these proposed Site A mitigation measures would be useful, they should be strengthened as follows:

   a. We recommend that any mitigation measures should not be limited solely to the confines of the designated federal critical habitat boundaries, as large concentrations of right whales have been documented outside of the defined critical habitat boundary.

   b. We recommend that the Navy make seasonal adjustments to the types and number of training scenarios. Exercises could be limited during the peak of calving season (December through March). At a minimum, the number of surface ships that must transit between Mayport and Site A should be reduced during this critical four-month period.

   c. We recommend that all Navy vessels transiting to or from Mayport and Site A should reduce speeds below the 15 to 17 knots reported as typical Navy ship transit speeds to reduce the risk of fatal collisions with right whales. The NMFS recently issued a ship speed rule (NMFS 2008) establishing a limit of 10 knots for non-exempt vessels and asking Federal vessels to voluntarily observe the rule when and where their missions would not be compromised.

d. Navy aircraft transiting between shore and Site A (and passing over critical habitat) should maintain a maximum feasible altitude to reduce potential impacts to right whales. Non-exempted civilian aircraft are prohibited from intentionally approaching within 460 m of any right whale (NMFS 2004) and we suggest transiting Navy aircraft maintain a distance of 460 m (500 yards) whenever possible. When they occur, right whale sightings and any observed behavioral reactions to passing aircraft should be documented and reported to the Early Warning System (EWS) network.

2. We recommend that the Navy assist in funding research on satellite tag technology that would improve the knowledge base of the migratory patterns and behaviors of right whales along the eastern U.S. seaboard. As noted previously, timing of migration is variable among years and is influenced by a number of environmental factors. The offshore extent of right whale migration, and influencing factors, are also poorly known. Satellite tagging of right whales would provide valuable information on migratory behavior that is difficult to obtain through traditional means, such as vessel or aerial studies, and would reduce uncertainty of right whale presence at the proposed USWTR.

3. Navy protocols for detecting right whales and other cetaceans call for shipboard and/or aerial observers and passive listening for detecting right whales and other marine mammals. The amount of dive time in conjunction with weather/visibility issues, however, will limit the ability of observers to detect marine mammals. From a ship, right whales can be more difficult to identify than other cetaceans because they lack a dorsal fin. Aural detection requires that animals are vocalizing. Little is currently known about the vocalization or diving behavior of right whales on migration or on the calving grounds; therefore the existing Navy protocols offer essential but not optimal protections. In addition, the DEIS did not provide specifications, such as altitude, spatial or temporal extent, etc., for the aerial surveys that they propose to conduct prior to commencement of warfare exercises. The efficacy of aerial surveys for detecting all cetaceans in an area is fair at best and is dependent upon flight specifications as well as environmental factors (visibility, Beaufort Sea State levels, winds, etc.). Detectability of mom/calf pairs for standardized aerial surveys in the southeast has been estimated to be as low as 33% (Hain *et al.* 1999).

   Because of the limitations of the proposed detection methods, we recommend that the Navy use additional methods for detecting the presence of marine mammals. Passive acoustic monitoring (e.g., using hydrophone arrays) provides greater detectability of vocalizing mammals than passive listening. Passive acoustic monitoring has been used previously by the Navy (Jarvis *et al.* 2002) and other researchers (i.e., Clark *et al.* 1996), and should be employed routinely in naval exercises. Additionally, the commonly publicized distance for recognizing human divers using sonar is a minimum of 700 m (i.e., http://www.arstech.de/diver_detection/diver_detection.html). Given that cetacean lungs are larger than human lungs, a cetacean should be detectable at a greater range than the customary 700 m for recognizing humans.

We recommend that the Navy take advantage of current detection methods, and assist with funding additional research to develop and improve methods of detecting cetaceans and recording their behavioral responses to noise exposure, such as:

a. Deploy satellite and time-depth recorders to record behavioral responses, such as diving patterns and directional changes of right whales to proposed activities, including ship transit and exposure to sonar.
b. Explore the use of low-power active sonar for detecting right whales and recording their behavioral responses to active sonar.
c. Develop a model of the propagation of sound in the shallow water environment of the chosen USWTR site for evaluating received sound levels if a marine mammal is inadvertently exposed during Navy exercises.

4. Provide funding for research on the auditory characteristics of baleen whales, particularly right whales, as well as the physiological and behavioral responses to sounds. Estimates of thresholds for Temporary Threshold Shifts (TTS) and Permanent Threshold Shifts (PTS) in the DEIS were largely conjecture because auditory characteristics of cetaceans, especially whales, are poorly studied. Further, behavioral responses of cetaceans to sound described in the DEIS were mainly derived from studies on captive animals (Schlundt *et al.* 2000, Finneran *et al.* 2001). Cetacean behavioral responses in the wild likely differ from those in captivity and additional studies of behavior in the wild, such as Nowacek *et al.* (2004), are needed. If any cetacean is inadvertently exposed to sonar during exercises, however, a full and thorough investigation should be conducted to evaluate impacts to the animal(s), contributing to the pool of information regarding TTS/PTS and behavioral responses of cetaceans.

   Although the Navy is proposing to reduce or cease active transmission levels when a whale or dolphin is detected within certain distances of the associated equipment (with reductions starting at 1,828 m and ceasing at 183 m), a marine mammal just outside of a 320-m detection limit could potentially receive > 181 dB re 1 μPa (based on a nominal source of 235 dB re 1 μPa @ 1 m of the SQS-53 sonar and the standard 6 dB decrease in SPL with a doubling of distance). Cetacean strandings in the Bahamas in March 2000, spatially and temporally coincident with naval exercises that were also using these mid-frequency sonars, could have been exposed to Sound Pressure Levels (SPL) of 160 dB re 1 μPa according to complex sound propagation models (International Council for the Exploration of the Sea [ICES] 2005). Likewise, strandings in the Canary Islands in September 2002 began soon after the start of naval exercises involving mid-frequency sonar (ICES 2005). The strandings mainly involved beaked whale species; however, effects of sound levels on other cetaceans, such as right whale females with calves, are largely unknown. Refined information on auditory and behavioral characteristics of cetaceans in response to sound, together with a good model of sound propagation and detection of marine mammal locations would greatly improve the ability to understand and mitigate potential impacts of these types of Navy activities.

5. We commend the Navy's support of the EWS aerial surveys and recognize the important role Fleet Area Control and Surveillance Facility Jacksonville plays in the dissemination of right whale sightings. The EWS aerial surveys serve a vital role in right whale research and management in the Southeast U.S. (e.g., ship strike mitigation, photo-identification data, detection of entangled or dead whales). The Navy should continue to support the EWS and ensure that increases in Navy training exercises do not interfere with EWS aerial surveys or hinder survey efforts as a result of airspace closures.

We appreciate the opportunity to provide input on this project and are available to provide additional assistance for our suggested mitigation proposals, if needed. Please do not hesitate to contact me at 850-410-5272 if you would like to coordinate further, or Tom Pitchford or Leslie Ward at 727-896-8626 if you have any technical questions regarding these comments.

Sincerely,

Mary Ann Poole

Mary Ann Poole, Director
Office of Policy and Stakeholder Coordination

map/mm
ENV 1-3-2
Undersea Warfare Training Range_1724

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Florida Fish and Wildlife Conservation Commission

Office of Policy and Stakeholder Coordination
Mary Ann Poole
Director
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Managing fish and wildlife resources for their long-term well-being and the benefit of people.

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MyFWC.com

October 24, 2008

Ms. Lauren Milligan
Florida State Clearinghouse
Department of Environmental Protection
3900 Commonwealth Boulevard, Mail Station 47
Tallahassee, Florida 32399-3000

Re: SAI #FL200809154433C, Duval Co., Draft Overseas Environmental Impact Statement/Environmental Impact Statement (DEIS), Undersea Warfare Training Range, Atlantic Ocean

Dear Ms. Milligan:

The Division of Marine Fisheries Management of the Florida Fish and Wildlife Conservation Commission (FWC) has completed additional review of the request for comments on the above referenced DEIS, under the Coastal Zone Management Act/Florida Coastal Management Program. These comments are provided as a supplement to the agency letter sent on October 20, 2008, and should be attached to that letter.

Background

The Navy is proposing to construct an Undersea Warfare Training Range (USWTR). The USWTR project would include instrumentation of a 500-square-nautical-mile area of ocean bottom with undersea cables and sensor nodes. Currently there are four proposed sites, with the most favored (Site/Alternative A) located approximately 93 km (50 nm) offshore of northeastern Florida in the Jacksonville Operating Area between 120 to 1,200 feet water depth range. The distance between nodes would vary from 1 to 3 nm, depending on water depth.

Potentially Affected Resources

The seabed within the proposed USWTR area and the trunk cable from the USWTR to the cable termination facility contains some habitats that are classified as essential fish habitat (EFH) pursuant to South Atlantic Fishery Management Council regulations, including live/hardbottom habitat, existing artificial/manmade artificial reef materials, and locations proposed for future artificial reef materials.

Potential Effects of the Proposal

Placement of cables within the proposed USWTR may impact existing live/hardbottom habitat, existing artificial/manmade artificial reef materials, and the placement of proposed for future artificial reef materials.

Concerns and Recommendations

<u>Concern #1:</u> Fact Sheet No. Seven on the project website (<u>http://projects.earthtech.com/USWTR/Public_Involvement/Public_Involvement_2008/PDF_fact_sheets_2008/FS7_Eff</u>

ects-on-Fishing-2008.pdf) illustrates the approximate locations of some of the existing artificial reef and natural areas in the vicinity of Site A, but the trunk cable location is not shown, and the illustration is not at a scale with enough detail to identify the artificial reef areas that may be effected by the proposed project.

Recommendation #1: Please include figures within the EIS at appropriate scales to illustrate the location of the proposed trunk cable, the locations of the existing artificial reef permitted areas, and the existing artificial reef materials within 500 feet of the proposed trunk cable.

Concern #2: There are 25 past and present permitted artificial reef areas located offshore of Jacksonville in the Atlantic Ocean between approximately 7 and 30 nautical miles from the St. Johns River Entrance Channel (Figure 1). Most of the sites are roughly rectangular in shape, with an average area of 2.4 square miles each. We are concerned that the proposed trunk cable placement may cross some of these sites, preventing future development of some of the existing artificial reef areas.

Recommendation #2: Please include in the EIS a description of the proposed route of the trunk cable, and how the existing charted artificial reef areas will be avoided.

Concern #3: In addition to the 25 existing artificial reef permitted areas which are illustrated on NOAA nautical chart #11488, there are some charted artificial reef materials and shipwrecks identified outside of the artificial reef "Fish Haven" areas, charted as "obstructions." We are concerned that some of those sites may be impacted by the trunk cable placement.

Recommendation #3: Please include in the EIS a description of the proposed route of the trunk cable, and how the existing artificial reef and shipwreck materials located outside the charted 'Fish Haven' areas will be avoided.

Concern #4: During the City of Jacksonville's recent reauthorization of the existing artificial reef permitted areas, existing charted telecommunications cables were identified and avoided. The DEIS for the USWTR does not provide any information describing existing telecommunication or other transmission cables in the vicinity of the trunk cable corridor and/or USWTR and how those existing cables will be avoided.

Recommendation #4: Please provide information in the EIS describing existing telecommunication or other transmission cables in the vicinity of the trunk cable corridor and/or USWTR and describe how those existing cables will be avoided.

Concern #5: To date, the deepest artificial reef site off of Jacksonville has a maximum depth of -110 feet MLLW. The City of Jacksonville is interested in acquiring a large military ship in the future for artificial reefing, but none of the existing artificial reef site depths are deep enough to accommodate a large military ship artificial reef. Due to navigational clearance and stability requirements, depending on the class of vessel selected for reefing, the City of Jacksonville's long-range artificial reef planning includes the selection of a deepwater artificial reef permitted area (a square site measuring 0.25 nm on a side, around approximately the 150-170 ft depth contour) for the purpose of sinking a large military vessel as an artificial reef. Unfortunately, the location of the proposed USWTR encompasses the areas that the City of Jacksonville has been considering for a future deepwater artificial reef site. While the DEIS mentions that anchoring and trawling may be prohibited within the boundaries of the proposed USWTR, the DEIS does not specifically state whether or not future artificial reef development would be prohibited. We are concerned that the creation of the USWTR may preempt future efforts to establish a deepwater artificial reef site offshore of Jacksonville.

Recommendation #5: Please include in the EIS a discussion on the possibility of permitting a future artificial reef permitted area within the boundaries of the USWTR, measuring 0.25 nm on a side, around the 150-170 ft depth contour.

Concern #6: The last paragraph on page 3.2-20 states "Within Site A, hard bottom areas comprise about 97% of the surveyed area in the range (1,026 km^2 [299 NM^2]) and 97% of the surveyed area in the corridor (1,540 km^2 [449 NM^2])." However, figure 3.2-3 clearly does not illustrate that 97% of the surveyed area is hardbottom.

Recommendation #6: Please review and correct the "97%" percent hard bottom coverage references in the last paragraph of page 3.2-20.

Concern #7: The first paragraph on page 3.2-21 provides a citation to "(FFWCC, 2005c)," but the reference list does not contain a citation for "FFWCC, 2005c."

Recommendation #7: Please describe and add the citation for "(FFWCC, 2005c)" to the reference list.

Concern #8: The DEIS references the deepwater Marine Protected Area (MPA) off North Florida that is intended to protect the habitat and stocks of deepwater overexploited fishes of the grouper-snapper complex. This was approved by the South Atlantic Fishery Management Council on 14 March 2007 as part of approval of Amendment 14 to the SAFMC Snapper-Grouper Fishery Management Plan. The North Florida MPA is proposed for establishment 60 nm east of Jacksonville, Florida. A request for comment on the final rule was published in the Federal Register on July 16, 2008 (Vol. 73 No. 137). This is to be a Type II MPA- no anchoring or bottom fishing, no use of shark bottom longlines- trolling for pelagics allowed and transit by grouper snapper boats with gear stowed are authorized. The area is intended to protect species and habitat of snowy, yellowedge, and misty grouper, speckled hind and blueline tilefish all of which are longlived and experiencing overfishing. Since the USWTR encompasses the North Florida MPA in its entirety, we presume that the USWTR was intentionally sited to encompass the North Florida MPA because of the existing MPA fishing gear restrictions. The DEIS does not specifically state what sort of bottom modifications will be created by the cable within the MPA.

Recommendation #8: Please provide additional description of the location of proposed cables and manner of construction that is intended to occur specifically within the boundaries of the North Florida MPA.

Concern #9: While the SEAMAP mapping data provides a broad overview of the benthic habitat distribution in each region, the SEAMAP data does not provide 100% coverage of the entire proposed USWTR. The DEIS does not state whether or not the Navy intends to conduct a more detailed mapping of the seafloor prior to trenching and/or cable placement to avoid impacts to existing hardbottom resources and artificial reefs.

Recommendation #9: Please provide more detailed mapping within the specific cable placement areas once those areas are chosen. Describe the methods that will be used to map, classify, and report the findings within each survey area.

Concern #10: The DEIS states that anchoring and trawling is proposed to be prohibited within the boundaries of USWTR Site A, but it is not clear if certain hook and line or other fishing gear types (other than bottom trawls) will be prohibited, such as shark bottom long lines, already prohibited in the North Florida MPA.

Recommendation #10: Please provide additional information in the EIS on the types of fishing gears that would be prohibited or permitted within the boundaries of the proposed USWTR.

Concern #11: The DEIS presents a weak case for predicting no significant behavioral effects on deepwater grouper-snapper complexes. If the acoustic sounds drive fish away or otherwise behaviorally impair them as in forming spawning aggregations, etc, that would be problematic especially for a special area specifically set aside as a designated marine protected area. All aspects of their deep reef natural ecology should be protected to the extent possible. Section 4.3.11 of the DEIS does not make that case for deepwater grouper-snapper complexes.

Recommendation #11: The EIS should include a discussion with greater emphasis on the acoustic effects of the proposed USWTR on deepwater grouper-snapper complexes. More research is needed on the subject in order to definitively support the italic statement at the conclusion of Section 4.3.11.

Concern #12: Section 6.4 of the DEIS does not state whether any mitigation measures are planned for impacts to hard bottom resources.

Recommendation #12: The EIS should include a discussion of the Navy's intentions for how impacts to hard bottom resources will be offset in the event that loss of hard bottom habitat occurs during trenching and placement of offshore cables. While the preferred option is avoidance of impacts, where appropriate, construction of artificial reefs (boulder reefs, concrete modules, etc.) have been successfully constructed as mitigation for similar projects that have impacted offshore hard bottom resources.

Summary

Thank you for the opportunity to comment. In summary, our primary concerns are associated with impacts to existing artificial reef materials, preemption of future development within existing permitted sites, and preemption of a future deepwater artificial reef site in the vicinity of the proposed USWTR. Please keep us informed of the Navy's responses to our concerns, and please do not hesitate to call if you have any questions. If you need any further assistance, please contact Mr. Keith Mille at the letterhead address, by email at keith.mille@myfwc.com, or by telephone at (850) 487-0554 x207.

Sincerely,

Mary Ann Poole, Director
Office of Policy and Stakeholder Coordination

map/lg/km
ENV 1-3-2
Undersea Warfare Training Range_1724_letter 2
Enclosure

Jacksonville Artificial Reef Sites

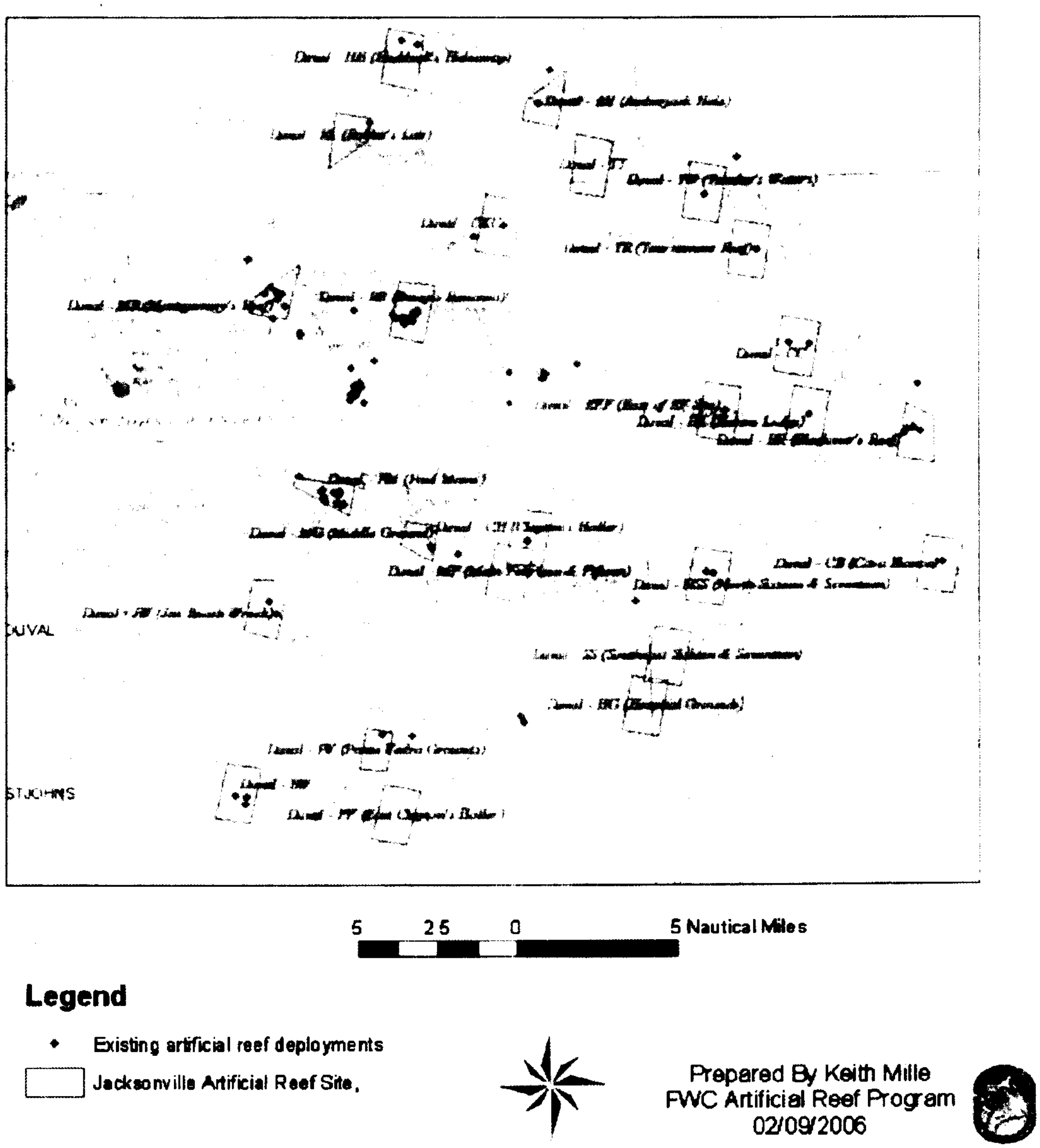

FIGURE 1. Map of the City of Jacksonville's 25 past and present artificial reef sites.

COUNTY: DUVAL
SCH - NAVY - 2008 - 6011

DATE: 9/15/2008
COMMENTS DUE DATE: 10/17/2008
CLEARANCE DUE DATE: 10/27/2008
SAI#: FL200809154433C
REFER TO: FL200710023787C

MESSAGE:
SEE HTTP://PROJECTS.EARTHTECH.COM/USWTR

STATE AGENCIES	WATER MNGMNT. DISTRICTS	OPB POLICY UNIT	RPCS & LOC GOVS
ENVIRONMENTAL PROTECTION			
FISH and WILDLIFE COMMISSION			
X STATE			

The attached document requires a Coastal Zone Management Act/Florida Coastal Management Program consistency evaluation and is categorized as one of the following:

- _ **Federal Assistance to State or Local Government (15 CFR 930, Subpart F). Agencies are required to evaluate the consistency of the activity.**
- X **Direct Federal Activity (15 CFR 930, Subpart C). Federal Agencies are required to furnish a consistency determination for the State's concurrence or objection.**
- _ **Outer Continental Shelf Exploration, Development or Production Activities (15 CFR 930, Subpart E). Operators are required to provide a consistency certification for state concurrence/objection.**
- _ **Federal Licensing or Permitting Activity (15 CFR 930, Subpart D). Such projects will only be evaluated for consistency when there is not an analogous state license or permit.**

Project Description:

DEPARTMENT OF THE NAVY - DRAFT OVERSEAS ENVIRONMENTAL IMPACT STATEMENT/ENVIRONMENTAL IMPACT STATEMENT FOR THE UNDERSEA WARFARE TRAINING RANGE (USWTR) - OFFSHORE OF JACKSONVILLE, DUVAL COUNTY, FLORIDA.

To: Florida State Clearinghouse

AGENCY CONTACT AND COORDINATOR (SCH)
3900 COMMONWEALTH BOULEVARD MS-47
TALLAHASSEE, FLORIDA 32399-3000
TELEPHONE: (850) 245-2161
FAX: (850) 245-2190

EO. 12372/NEPA
- [x] No Comment
- [ ] Comment Attached
- [ ] Not Applicable

Federal Consistency
- [x] No Comment/Consistent
- [ ] Consistent/Comments Attached
- [ ] Inconsistent/Comments Attached
- [ ] Not Applicable

From:
Division/Bureau: Division of Historical Resources
Bureau of Historic Preservation

Reviewer: Edwards, S. Laura A. Kammerer, Deputy SHPO

Date: 9-23-08 9.23.2008

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DEP Office of Intergovt'l Programs

Rcd 9/12

DEPARTMENT OF THE NAVY
COMMANDER
U.S. FLEET FORCES COMMAND
1562 MITSCHER AVENUE SUITE 250
NORFOLK, VA 23551-2487

5090
Ser N4/N7/106
April 29, 2009

Ms. Kelie Cochran
Federal Consistency Coordinator
Georgia Department of Natural Resources
One Conservation Way, Suite 300
Brunswick, GA 31520-8687

Dear Ms. Cochran:

The U.S. Navy is proposing to instrument a 1,713-square-kilometer (km^2) (500 square nautical mile [NM^2]) area of the ocean with undersea cables and sensor nodes and to use the area for anti-submarine warfare (ASW) training. The landward edge of the Undersea Warfare Training Range (USWTR) would be located approximately 93 km (50 NM) offshore of northeastern Florida and well outside of Georgia's coastal waters. A trunk cable connecting the range to a shore facility at Naval Station Mayport would be buried to a depth of approximately 0.3 to 0.9 meters (1 - 3 feet). The purpose of the USWTR is to enable the U.S. Navy to train effectively with mid-frequency active sonar in littoral conditions, supporting the requirements of the Fleet Readiness Training Plan, and in a location suitable for Atlantic Fleet ASW-capable units.

Pursuant to Section 307 (c)(1), 16 United States Code 1456 of the Coastal Zone Management Act of 1972, as amended, we have determined that the proposed action will: (1) be conducted in a manner consistent with the enforceable policies of Georgia's approved coastal management program; and (2) not impact natural or cultural resources of the State's coastal zone. The basis for this "Negative Determination" is detailed in Enclosure (1) based on the enforceable policies in the State's federally-approved coastal management plan[1]. Enclosure (2) is a matrix that contains Georgia Department of Natural Resources comments on the Draft EIS and the U.S. Navy's responses to each.

Enclosure (3) is a CD-ROM which contains the USWTR pre-release version of the Final Environmental Impact Statement (EIS)/Overseas EIS (OEIS), and the Essential Fish Habitat Assessment, which was provided to the National Marine Fisheries Service (NMFS) in April, 2009. These two documents are provided to assist in making your determination. Note that these two documents are not for public release at this time. Further information regarding the USWTR EIS/OEIS may be obtained by visiting the project's website: http://projects.earthtech.com/uswtr/.

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[1] See CZMA Section 304 (16 USC 1453 (6a)). An enforceable policy is a state policy that is legally binding under state law, and by which a state exerts control over private and public coastal uses and resources, and which are incorporated in the state's federally-approved coastal management plan. An enforceable policy is limited to a state's jurisdiction and must be given legal effect by state law and cannot apply to federal lands, federal waters, federal agencies, or other areas or entities outside the state's jurisdiction, unless authorized by federal law.

5090
Ser N4/N7/106
April 29, 2009

In accordance with 15 Code of Federal Regulations (CFR) § 930.35, the Department of the Navy has reviewed Georgia's coastal management program and associated enforceable policies and has determined that the proposed construction of, and training on, the USWTR would have no reasonably foreseeable effects to the State's coastal zone or its resources.

In accordance with 15 CFR § 930.35(c), the State of Georgia has 60 days from the receipt of this document in which to concur with, or object to, this Negative Determination, or to request an extension under 15 CFR § 930.41(b). We are seeking your concurrence with our Negative Determination, and as a possible means to expedite this process, my staff is prepared to discuss this proposal in more detail and answer any questions you or your staff may have. Our point of contact is Ms. Lesley Leonard, Naval Facilities Engineering Command, Atlantic, (757) 322-4645.

Georgia's concurrence will be presumed if its response is not received by the U.S. Navy (Atlantic Fleet) within 60 days from receipt of this Determination. Georgia's response or other inquires should be sent to: Naval Facilities Engineering Command, Atlantic, Attn: Code EV22 (USWTR EIS/OEIS Project Manager), 6506 Hampton Boulevard, Norfolk, Virginia 23508-1278; or Facsimile (757) 322-4894. If additional information should be required, requests for such information should be requested within ten days of receipt of this Negative Determination.

Sincerely,

J. W. MURPHY
Deputy Chief of Staff
for Operational Readiness
and Training

Enclosures:
1. Federal Agency CZMA Negative Determination for Georgia
2. Georgia Department of Natural Resources DEIS comments and U.S. Navy responses
3. USWTR pre-release Final EIS/OEIS and Essential Fish Habitat Assessment CD-ROM

DEPARTMENT OF THE NAVY
COMMANDER
U.S. FLEET FORCES COMMAND
1562 MITSCHER AVENUE SUITE 250
NORFOLK, VA 23551-2487

5090
Ser N4/N7/105
April 29, 2009

Ms. Lauren P. Milligan
Florida State Clearinghouse
Department of Environmental Protection
3900 Commonwealth Blvd., M.S. 47
Tallahassee, FL 32399-3000

Dear Ms. Milligan:

The U.S. Navy is proposing to instrument a 1,713-square-kilometer (km^2) (500 square nautical mile [NM^2]) area of the ocean with undersea cables and sensor nodes and to use the area for anti-submarine warfare (ASW) training. The landward edge of the Undersea Warfare Training Range (USWTR) would be located approximately 93 km (50 NM) offshore of northeastern Florida and well outside of Florida coastal waters. Within Florida's coastal zone, a trunk cable connecting the range to a shore facility at Naval Station Mayport would be buried to a depth of approximately 0.3 to 0.9 meters (1 - 3 feet). The purpose of the USWTR is to enable the U.S. Navy to train effectively with mid-frequency active sonar in littoral conditions, supporting the requirements of the Fleet Readiness Training Plan, and in a location suitable for Atlantic Fleet ASW-capable units.

Pursuant to Section 307 (c)(1), 16 United States Code (USC) 1456 of the Coastal Zone Management Act (CZMA) of 1972, as amended, we have determined that the proposed action will be conducted in a manner consistent with the enforceable policies of Florida's approved coastal management program. The basis for this "Coastal Consistency Determination" is detailed in Enclosure (1) based on the enforceable policies in the State's federally-approved coastal management plan[1]. Enclosure (2) is a matrix that contains Florida Department of Environmental Protection's comments on the Draft Environmental Impact Statement (EIS) and the U.S. Navy's responses to each.

Enclosure (3) is a CD-ROM which contains the USWTR pre-release version of the Final EIS/Overseas EIS (OEIS), and the Essential Fish Habitat Assessment, which was provided to the National Marine Fisheries Service (NMFS) in April, 2009. These two documents are provided to assist in making your determination. Note that this document is not for public release at this time. Further information regarding the USWTR EIS/OEIS may be obtained by visiting the project's website: http://projects.earthtech.com/uswtr/.

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[1] See CZMA Section 304 (16 USC 1453 (6a)). An enforceable policy is a state policy that is legally binding under state law, and by which a state exerts control over private and public coastal uses and resources, and which are incorporated in the state's federally-approved coastal management plan. An enforceable policy is limited to a state's jurisdiction and must be given legal effect by state law and cannot apply to federal lands, federal waters, federal agencies, or other areas or entities outside the state's jurisdiction, unless authorized by federal law.

In accordance with 15 Code of Federal Regulations (CFR) Section 930.32, the Department of the Navy has reviewed Florida's coastal management program and associated enforceable policies and has determined that the construction activities associated with installation of the trunk cable within Florida's coastal zone are consistent to the maximum extent practicable.

In accordance with 15 CFR Section 930.41(a), the State of Florida has 60 days from the receipt of this document in which to concur with, or object to, this Consistency Determination, or to request an extension under 15 CFR Section 930.41(b). Given the critical nature of this training, we are seeking your concurrence with our Consistency Determination. As a possible means to expedite this process, my staff is prepared to discuss this proposal in more detail and answer any questions you or your staff may have. Our point of contact is Ms. Lesley Leonard, Naval Facilities Engineering Command, Atlantic, (757) 322-4645.

Florida's concurrence will be presumed if its response is not received by the U.S. Navy (Atlantic Fleet) within 60 days from receipt of this Determination. Florida's response or other inquiries should be sent to: Naval Facilities Engineering Command, Atlantic, Attn: Code EV22 (USWTR OEIS/EIS Project Manager), 6506 Hampton Blvd., Norfolk, Virginia 23508-1278; or Facsimile (757) 322-4894. If additional information should be required, requests for such information should be requested within ten days of receipt of this Consistency Determination.

Sincerely,

J. W. MURPHY
Deputy Chief of Staff
for Operational Readiness
and Training

Enclosures:
1. Florida USWTR Coastal Consistency Determination
2. Florida Department of Environmental Protection DEIS comments and U.S. Navy responses
3. USWTR pre-release Final EIS/OEIS and Essential Fish Habitat Assessment CD-ROM

DEPARTMENT OF THE NAVY
COMMANDER
U.S. FLEET FORCES COMMAND
1562 MITSCHER AVENUE SUITE 250
NORFOLK, VA 23551-2487

5090
Ser N4/N7/104
April 23, 2009

Dr. Pace Wilber
Atlantic Branch Chief, Charleston (F/SER47)
National Marine Fisheries Service
P.O. Box 12559
Charleston, SC 29422-2559

Dear Dr. Wilber:

In accordance with the Magnuson-Stevens Fishery Conservation and Management Act (MSA), U.S. Fleet Forces (USFF) has prepared an essential fish habitat (EFH) assessment for the installation and operation of an Undersea Warfare Training Range (USWTR) offshore of Jacksonville, Florida (Enclosure (1)). USFF's assessment concludes that EFH may be adversely affected by the installation and operation of the range and requests initiation of the MSA EFH consultation process. U.S. Navy's final decision on the USWTR proposal will occur in July 2009, and therefore, we appreciate the National Marine Fisheries Service's (NMFS) response within the required timelines identified at 50 Code of Federal Regulations 600.920(h) or (i), as appropriate.

The staffs at USFF and NMFS Southeast Regional Office (SERO) have initiated coordination on the USWTR proposal and we appreciate the expertise provided by NMFS to date. SERO staff reviewed USFF's September 2008 Draft Environmental Impact Statement (DEIS) and USFF has used NMFS's comments and recommendations to prepare and revise the enclosed EFH assessment. Please note the required description of the USWTR project may be found in USFF's DEIS previously provided to SERO, and also located at: http://projects.earthtech.com/uswtr/EIS/DOEIS-EIS_2008/DOEIS_2008.htm. The U.S. Navy's preferred alternative for evaluation in this consultation is the Jacksonville alternative (Site A).

We appreciate your continued support in helping us to meet our EFH responsibilities. Please feel free to contact Mr. David MacDuffee, (757) 836-8473, E-Mail: David.MacDuffee@navy.mil; or Mr. Jene Nissen, (757) 836-5221, E-Mail: Richard.J.Nissen@navy.mil, at USFF on this matter.

Sincerely,

D. F. BAUCOM
Assistant Deputy Chief of Staff
for Operational Readiness
and Training

Enclosure: 1. EFH Assessment for the Installation and Operation of USWTR

DEPARTMENT OF THE NAVY
OFFICE OF THE CHIEF OF NAVAL OPERATIONS
2000 NAVY PENTAGON
WASHINGTON, DC 20350-2000

IN REPLY REFER TO

5090
Ser N456K/8U158321
16 October 2008

Mr. Jim Lecky, Director
Office of Protected Resources
National Oceanic and Atmospheric Administration
National Marine Fisheries Service (NMFS)
B-SSMC3 Room 13821
1315 East-West Highway
Silver Spring, MD 20910-3282

Dear Mr. Lecky:

In accordance with Section 7 of the Endangered Species Act (ESA), the Navy has prepared a Biological Assessment (BA) for the Installation and Operation of an Undersea Warfare Training Range (USWTR) offshore of Jacksonville, Florida (Enclosure [1]). As the staff at NMFS Office of Protected Resources is aware, we are also requesting under separate cover a Marine Mammal Protection Act rulemaking and Letter of Authorization (LOA) for this action.

In December 2004, Navy initiated informal consultation on this action via electronic submittal of a draft BA to your staff. Subsequent meetings were held with your staff on December 14, 2004 in Silver Spring, MD and via teleconference on January 10, 2005. The Navy initiated formal consultation on October 20, 2005.

Subsequently, the Navy decided that a revised Draft Overseas Environment Impact Statement/Environmental Impact Statement(Draft OEIS/EIS) should be prepared based on comments received during the public comment period, changes in technology that obviated the need for a secure landside cable termination facility (CTF), and changes in the methodology by which acoustic impacts to marine mammals are assessed. The Navy published an Notice of Intent(NOI) to prepare the revised Draft OEIS/EIS and to open another scoping comment period in the Federal Register on September 21 2007. An NOI for the revised Draft OEIS/DEIS was published in the Federal Register on September 12, 2008.

As a result of the significant changes to the proposed action as well as impact assessment methodology, the Navy has prepared a new Biological Assessment (enclosure [1]) which assesses effects to listed species associated with the proposed construction and operation at the Navy's preferred alternative location off the coast of Jacksonville, FL (Site A). Should one of the other alternatives identified in the revised Draft OEIS/EIS (enclosure [2]) become the preferred alternative, the Navy would submit a new BA based on the assessment included in the revised Draft OEIS/EIS.

This BA is an assessment of potential impacts to species listed under the ESA that may be present in the proposed action area. Species considered in this assessment include the North Atlantic right whale (Eubalaena glacialis), humpback whale (Megaptera novaeangliae), sei whale (Balaenoptera boreali), fin whale (Balaenoptera physalus), blue whale (Balaenoptera musculus), sperm whale (Physeter macrocephalus), West Indian manatee (Trichechus manatus), loggerhead sea turtle (Caretta caretta), green sea turtle (Chelonia mydas), hawksbill sea turtle (Eretmochelys imbricata), leatherback sea turtle (Dermochelys coriacea), Kemp's ridley sea turtle (Lepidochelys kempii), shortnose sturgeon (Acipenser brevirostrum), and smalltooth sawfish (Pristis pectinata).

The Navy has determined that the installation of and operations on the proposed USWTR may affect the following species: North Atlantic right whale, humpback whale, sei whale, fin whale, blue whale, sperm whale, green sea turtle, hawksbill sea turtle, Kemp's ridley sea turtle, leatherback sea turtle, and loggerhead sea turtle.

We appreciate your continued support in helping us to meet our Section 7 responsibilities. Please feel free to contact myself (703-602-2787 or Ronald.tickle@navy.mil) or Mr. Jene Nissen (757-836-5221 or Richard.J.Nissen@navy.mil) at U.S. Fleet Forces Command on this matter.

Sincerely,

R E Tickle

Ronald E. Tickle
Head, Operational Environmental
Readiness and Planning Branch
Environmental Readiness Division
(OPNAV N45)

Enclosures:
(1) Biological Assessment for the Installation and Operation of an Undersea Warfare Training Range (CD and Hard Copy)
(2) Revised Draft Overseas Environmental Impact Statement/Environmental Impact Statement for the Undersea Warfare Training Range (CD copy)

Copy to (with enclosures):

Dr. Roy Crabtree, Regional Administrator
National Oceanic and Atmospheric Administration
National Marine Fisheries Service
Southeast Regional Office
Copy to (without enclosures):
CFFC N4/N7
OPNAV N43

UNITED STATES DEPARTMENT OF COMMERCE
National Oceanic and Atmospheric Administration
NATIONAL MARINE FISHERIES SERVICE
1315 East-West Highway
Silver Spring, Maryland 20910
THE DIRECTOR

FEB 1 2 2004

The Honorable Donald R. Schregardus
Deputy Assistant Secretary
of the Navy (Environment)
Department of the Navy
1000 Navy Pentagon
Washington D.C. 20350-1000

Dear Deputy Assistant Secretary Schregardus

Thank you for your letter requesting the National Marine Fisheries Service (NMFS) to be a cooperating agency (as defined by the Council on Environmental Quality (40 CFR 1501.6)) in the preparation of an Environmental Impact Statement (EIS). The EIS will address the potential environmental impacts of the installation and operation of the East Coast Shallow Water Training Range (ECSWTR). The proposed ECSWTR will be used for Anti-Submarine Warfare training in the shallow water environment off either Norfolk, Virginia, or Onslow Bay, North Carolina.

We support the U.S. Navy's determination to do an EIS on this activity. NMFS agrees to be a fully cooperating agency in the preparation and review of this EIS and reserves the ability to review and comment on that document when it is released to the general public. In addition, NMFS is responsible for the processing of incidental take applications for Letters of Authorization (LOAs) under section 101(a)(5)(A) of the Marine Mammal Protection Act, and will also be in formal consultation under section 7 of the Endangered Species Act on the issuance of the proposed ECSWTR installation and operation. Provided our comments are satisfactorily addressed in the Navy's Administrative Record, NMFS is prepared to adopt the U.S. Navy's EIS when making its determination on the issuance of LOAs.

If you need any additional information, please contact Ms. Sarah Hagedorn, (301) 713-2322, ext 7, or Mr. Kenneth Hollingshead, (301) 713-2322, ext. 128.

Sincerely,

William T. Hogarth, Ph.D.

THE ASSISTANT ADMINISTRATOR
FOR FISHERIES

DEPARTMENT OF THE NAVY
OFFICE OF THE ASSISTANT SECRETARY
(INSTALLATIONS AND ENVIRONMENT)
1000 NAVY PENTAGON
WASHINGTON, D.C. 20350-1000

JAN 26 2004

Dr. William T. Hogarth
Assistant Administrator
National Oceanic and Atmospheric
Administration (NOAA) Fisheries
1315 East West Highway
Silver Spring, MD 20910

Dear Dr Hogarth,

The Navy is currently undertaking an Environmental Impact Statement (EIS) to study the environmental effects of installation and operation of the East Coast Shallow Water Training Range (ECSWTR). The proposed ECSWTR will be used for Anti-Submarine Warfare (ASW) training in the shallow water environment. ASW training includes the use of tactical sonar, which potentially affects marine species. In order to adequately evaluate the potential environmental impacts of the installation and operation of the ECSWTR, the Navy and NOAA Fisheries have been working together, particularly in regards to potential acoustic impacts to marine species protected under the Marine Mammal Protection Act (MMPA) and the Endangered Species Act (ESA). It is Navy's desire to formalize this relationship as outlined in the CEQ guidelines (40 CFR Part 1501).

As defined in 40 CFR 1501.5, the Navy is the lead agency for the ECSWTR. As NOAA Fisheries has jurisdiction by law and special expertise over the protected marine species that will potentially be affected by training activities on the ECSWTR range, the Navy is requesting that NOAA Fisheries be a cooperating agency as defined in 40 CFR 1501.6.

As the Lead Agency, the Navy will be responsible for the following:

- Preparing the environmental analysis, background information and all necessary permit applications associated with the proposed East Coast SWTR.

- Working with NOAA Fisheries personnel to develop and refine the method of estimating potential impacts to protected marine species.

- Circulating the appropriate NEPA documents to the public and other interested parties.

- Scheduling and supervising public meetings held in support of the NEPA process. This shall also include, without limitation, compiling and responding to comments received at these meetings

- Participating, as appropriate, in public meetings hosted by the NOAA Fisheries for receipt of public comment on protected species permit applications. This shall also include assistance in NOAA Fisheries' response to comments.

- Responding to all Freedom of Information Act (FOIA) requests in relation to the environmental impact statement.

- Scheduling meetings requested by NOAA Fisheries in a timely manner.

As the Cooperating Agency, NOAA Fisheries would be asked to support the Navy in the following manner:

- Providing timely comment to the environmental impact analyses conducted by the Navy.

- Coordinating, to the maximum extent practicable, any public comment period necessary in the MMPA permitting process with the Navy's NEPA public comment period.

- Participating, as appropriate, in public meetings hosted by the Navy for receipt of public comment on the NEPA document and environmental analysis.

- Scheduling meetings requested by Navy in a timely manner.

The Navy views this agreement as a formalization of the cooperative inter-agency relationship that has already been developed on the ECSWTR project. Input from your protected resources staff has been invaluable in determining the best course of action to take in predicting the potential effects of acoustic sources on marine mammals. It is the Navy's goal to complete this analysis as expeditiously as possible, while utilizing the best scientific information available. NOAA Fisheries continues to be invaluable in that endeavor.

Sincerely,

Donald R. Schregardus
Deputy Assistant Secretary of the Navy
(Environment)

APPENDIX H

USWTR Draft OEIS/EIS Comment Matrix

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H USWTR Draft OEIS/EIS Comment Matrix

This appendix contains the comments received on this Undersea Warfare Training Range (UWTR) draft Overseas Environmental Impact Statement/Environmental Impact Statement (OEIS/EIS). Publication of the notice of availability of the USWTR draft OEIS/EIS was made in the *Federal Register* on September 12, 2008 starting a 45-day comment period which closed on October 27, 2008. The document was distributed to officials of federal, state, and local governments, citizen groups and associations, and other interested parties. In addition, the draft OEIS/EIS was available for review on the USWTR Web site. During the comment period, four public meeting/hearings were held in: Chincoteague, Virginia; Morehead City, North Carolina; North Charleston, South Carolina; and Jacksonville, Florida.

Oral and written comments provided during the public meetings/hearings, as well as comments submitted via mail, by computer to the USWTR Web site, or fax during the public comment period were evaluated. Twenty-five people presented oral comments and 6 people submitted comment forms during the meetings/hearings. Sixty-two letters were submitted by mail and 23 letters were submitted to the USWTR Web site. There were 5,070 comment letters submitted by fax.

To facilitate the organization of the comments and the preparation of responses to the comments, the transcripts and comment letters were coded by origin of the letter: federal agency (code ‘F’), state agency (code ‘S’), local government (code ‘L’), non-government organization (code ‘NGO’), and public (code ‘P’) and specific author. The letters were numbered based upon the order in which they were coded. Letters were reviewed and specific comments were identified as passages in the letter with a specific comment related to USWTR or the content of the draft OEIS/EIS; each comment was numbered based upon its location in the letter (i.e., the first comment was numbered ‘1’). Specific comments were marked on the transcript/letter. Comments were then summarized and categorized by subject in a comment matrix.

The USWTR draft OEIS/EIS comment matrix spreadsheet is contained in this appendix. In total, 948 comments were identified from the review of the transcripts and comment letters; each comment is contained in one of the 948 rows in the table. The comment matrix is organized by the designation of the comment into one of 20 comment categories (and applicable subcategories). In regard to the letters submitted by fax, almost all (99 percent) were the same content and format with only minor text variations. A sample letter submitted by fax was coded and is contained in the comment matrix with the letter code P-091. A CD-ROM containing all comment and scoping letters received by the Navy during the comment periods is available by request. Requests should be made by mail to: Naval Facilities Engineering Command Atlantic, ATTENTION: Code EV22LL (USWTR OEIS/EIS PM), 6506 Hampton Boulevard, Norfolk, Virginia 23508-1278; or by a fax to (757) 322-4894.

Comments were considered and a response to each comment was prepared by Navy staff and their consultants that are experts in the comment category and subcategory. Summarized comments and the Navy's response follow, often referencing subchapters from, and documents referenced within, the final OEIS/EIS. Many of the comments resulted in modifications of the text of the USWTR final OEIS/EIS.

A total of 163 comments were received on the USWTR draft OEIS/EIS. These comments were considered in the preparation of the final OEIS/EIS. Table H-1 identifies the number of letters received by each commenter classification. Tables H-2 through H-6 provide a listing of comment letters received on the USWTR draft OEIS/EIS by federal agencies, state agencies, local agencies, non-governmental organizations, and individuals, respectively.

Table H-1

Summary of Comments

Commenter Classification	Number of Commenters
Federal Agencies	6
State Agencies	22
Local Government	3
Non-Governmental Associations/Organizations	28
Individuals	104
Total	**163**

Table H-2

Federal Agency Comments

Commenter	Affiliation	Commenter Number
Hogue, Gregory	Department of the Interior (DOI)	F-001
Campbell, John H.	NASA	F-002
Oynes, Chris C.	Minerals Management Service (MMS)	F-003
Ragen, Timothy J.	Marine Mammal Commission	F-004
Mueller, Heinz J.	USEPA	F-005
Kertis, Edward. J.	USACE Savannah Office	F-006

Table H-3

State Agency Comments

Commenter	Affiliation	Commenter Number
Perry, Robert D.	South Carolina Department of Natural Resources	S-001
Gestwicki, Tim	North Carolina Wildlife Federation	S-002
Rynas, Stephen	North Carolina Division of Coastal Management (NCDCM)	S-003
Gledhill-Early, Renee	NC State Clearinghouse Dept of Administration	S-004
Dunn, Maria T.	North Carolina Wildlife Resources Commission (NCWRC)	S-005
Duval, Michelle	North Carolina Division of Marine Fisheries (NCDMF)	S-006
McGee, Melba	North Carolina Department of Environment and Natural Resources (NCDENR)	S-007
Currin, Mac	NC Marine Fisheries Commission	S-008
Irons, Ellie	Virginia Department of Environmental Quality (VADEQ)	S-009
Jefferson, A.	VA Dept of Historic Resources	S-010
Narasinham, Kotur S.	VADEQ Div of Air Program Coordination	S-011
Badger, George H., III	Virginia Marine Resources Commission (VAMRC)	S-012
Hollis, Michelle. R.	VADEQ	S-013
Munson, Robert S.	Virginia Department of Conservation and Recreation (VADCR)	S-014
Ewing, Amy	VA Dept of Game and Inland Fisheries (VDGIF)	S-015
Heller, Matthew	VA Dept of Mines, Minerals and Energy	S-016
Herman, Paul E. & Kohler, Paul	VADEQ Waste Division	S-017
Holcomb, Noel	GA Dept of Natural Resources (GADNR)	S-018
Johnson, Kelly	NC Division of Environmental Health	S-019
Griffin, Lynn	FL Department of Environmental Protection (FLDEP)	S-020
Poole, Mary Ann	FL Fish and Wildlife Conservation Commission (FFWCC)	S-021
Edwards, S.	FL Division of Historical Resources - Bureau of Historic Preservation	S-022

Table H-4

Local Agency Comments

Commenter	Affiliation	Commenter Number
McCarthy, Julian	Office of the Mayor of Jacksonville	L-001
Haley, John	Jacksonville Chamber of Commerce	L-002
Morton, Robert	City of Jacksonville Artificial Reef Coordinator	L-003

Table H-5

Non-Governmental Organization Comments

Commenter	Affiliation	Commenter Number
Wray, Russell	Citizens Opposing Active Sonar Threats (COAST)	NGO-001
Kiekow, Taryn G.	Natural Resources Defense Council (NRDC)	NGO-002
Eatman, Jerome R. Jr.	Lynch & Eatman, LLP	NGO-003
Spruill, John R.	PenderWatch & Conservancy	NGO-004
Cornish, Vicky	Ocean Conservancy	NGO-005
Koelsch, Jessica	Ocean Conservancy	NGO-006
Larson, Tom	Sierra Club	NGO-007
Froehlich, Ed	Jacksonville Area Ship Repair Association	NGO-008
Miller, J.D.	Sierra Club	NGO-009
Langrish, Art	Cypress Sierra Group	NGO-010
Delaney, Richard F.	Provincetown Center for Coastal Studies	NGO-011
Nowlin, Michelle B.	Duke Environmental Law & Policy Clinic	NGO-012
Flocken, Jeffrey	International Fund for Animal Welfare	NGO-013
Rossiter, William	Cetacean Society International	NGO-014
Grainey, Karen	Sierra Club (GA Chapter)	NGO-015
Knowlton, Amy R.	New England Aquarium	NGO-016
Wannamaker, Catherine M.	Southern Environmental Law Center	NGO-017
Williams, Taffy	NY Whale and Dolphin Action League	NGO-018
Renshaw, Katie	Earthjustice	NGO-019
Loelsch, Jessica	Ocean Conservancy	NGO-020
Bremer, Linda M.	Sierra Club Florida	NGO-021
Kalakauskis, Ed	Jacksonville Offshore Fishing Club	NGO-022
Anonymous	PenderWatch & Conservancy	NGO-023
Anonymous	PenderWatch & Conservancy	NGO-024
Wray, Russell	Citizens Opposing Active Sonar Threats (COAST)	NGO-025
Jasny, Michael	Natural Resources Defense Council (NRDC)	NGO-026
Spruill, John R.	PenderWatch & Conservancy	NGO-027
Spruill, John R.	PenderWatch & Conservancy	NGO-028

Table H-6

Public Individuals

Full Name	Commenter Number	Full Name	Commenter Number
Alsentzer, Dorothée A.	P-083	Hass, Marsha	P-030
Alsentzer, Mary and Ulrich	P-066	Hill, David	P-042
Andrews, John	P-046	Hinckle, Megan	P-034
Archer, Linda	P-096	Hines, Dwight	P-020
Armstrong, Frances T.	P-069	Hines, Dwight	P-089
Asly, Sandy	P-025	Johnson, Wayne	P-024
Beasley, Jean	P-027	Kauskis, Ed	P-063
Berkman, Budd	P-017	Kirkwood, Jennifer	P-090
Boldt, Marjorie A.	P-055	Kivlehan, Milly	P-051
Bonhom, Sandra	P-071	Martin, Alison	P-014
Bonilla-Jones, Carmen	P-100	Martin, Tim	P-078
Bonner, Teresa	P-065	Matthaei, Carl & Marcella	P-074
Booher, Sam	P-002	Matthaei, Julie	P-018
Booher, Sam	P-040	McCarthy, Robin	P-091
Brown, Mary L.	P-068	McCormick, Maggie	P-079
Browning, Jan	P-041	Meserve, John	P-062
Burroughs, Karen	P-093	Moore, Gary D., P.H.G.	P-070
Capozzelli, J.	P-016	Neal, Tyler	P-087
Carey, Doris	P-004	Nowlin, Michelle	P-035
Carey, Doris	P-049	Patterson, Brian	P-036
Carter, Larry	P-088	Phibbs, Marilyn	P-098
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Van Saum, David	P-058	Anonymous	P-006
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Name/Agency	Letter Number	Comment Category	Comment Subcategory	Comments	Response
Marine Mammal Commission / Ragen, Timothy J.	F-004.2	Acoustic Modeling	Biological Assumptions	Recommends peer review of data and analysis used for risk assessment due to multiple assumptions and uncertainties.	Risk assessment model was developed in coordination with NMFS using the best available science; the model has been peer-reviewed by scientists who are experts in this analysis.
Sierra Club / Larson, Tom	NGO-007.3	Acoustic Modeling	Biological Assumptions	Navy's claim of no harm doesn't match the numerical results of the DEIS.	Exposure numbers do not equate to harm. Refer to Subchapter 1.6.2 discussion of definition of harassment vs. harm. The Navy coordinated with NMFS on all conclusions.
Provincetown Center for Coastal Studies / Delaney, Richard F.	NGO-011.5	Acoustic Modeling	Biological Assumptions	Not enough data to support 'no significant impact' to right whales. NRC: there are limited observations on the effects of ocean noise on marine mammals, and short- and long-term effects are poorly understood. Marine mammals change their vocalization patterns in the presence of background noise.	Please refer to mitigation in revised Chapter 6 and Chapter 4.3. The EIS represents the best available and most applicable science.
Provincetown Center for Coastal Studies / Delaney, Richard F.	NGO-011.6	Acoustic Modeling	Biological Assumptions	Center's modeling study suggests impact on search behavior, distribution, and caloric intake (decreased fitness) with variations in sensory range; such as that expected by TTS.	Data and analysis cited from this meeting (2008 North Atlantic Right Whale Consortium Annual Meeting) has not been peer-reviewed, and is specified by the meeting literature as 'not to be cited.'

Name/Agency	Letter Number	Comment Category	Comment Subcategory	Comments	Response
Duke Environmental Law & Policy Clinic	NGO-012.2	Acoustic Modeling	Biological Assumptions	DEIS claims no, or insignificant, impact without explanation or analysis. This assessment is based on incomplete or nonexistent data. This taints the 'cumulative impacts' analysis later in the document.	See Subchapter 4.3.2 and Appendix E for the discussion of analysis. The results of the analysis are addressed in Subchapter 4.8. The EIS represents the best available and most applicable science. The Navy will implement a monitoring plan, and will coordinate results of the monitoring with NMFS.
Duke Environmental Law & Policy Clinic	NGO-012.43	Acoustic Modeling	Biological Assumptions	DEIS downplays potential impacts, and avoids explanation of mitigation measures and how impacts will affect larger ecosystem.	The EIS represents the best available and most applicable science. The Navy will implement a monitoring plan and will coordinate results of the monitoring with NMFS.
Cetacean Society International / Rossiter, William	NGO-014.2	Acoustic Modeling	Biological Assumptions	DEIS does not include recent evidence of the negative impacts of active sonar on marine animals, and ship strike potential. Many cited resources outdated or disproven.	The Navy has been thorough in research and has used a wide variety of sources. In compliance with NEPA and EO 12114, the best available data was used. The authors assessed the quality of identified data, including only references exhibiting utility, integrity, and objectivity.
Sierra Club (GA Chapter) / Grainey, Karen	NGO-015.3	Acoustic Modeling	Biological Assumptions	Concern that research of the effects of sonar on loggerhead turtles and economically important organisms (blue crab and shrimp) is inadequate.	Please refer to Subchapter 3.3.2.3: data indicate the sea turtles can't hear the type of sonar to be used on USWTR. Please refer to Subchapter 3.3.2.1 for discussion on invertebrates.

Name/Agency	Letter Number	Comment Category	Comment Subcategory	Comments	Response
Southern Environmental Law Center / Wannamaker, Catherine M.	NGO-017.1	Acoustic Modeling	Biological Assumptions	DEIS repeatedly asserts 'no significant impact' often based on speculation and ignoring the best available science	The Navy coordinated with NMFS on all potential impacts to marine resources. No long term or significant impacts are anticipated. The best available and most applicable science was used in the preparation of the EIS.
NY Whale and Dolphin Action League / Williams, Taffy	NGO-018.8	Acoustic Modeling	Biological Assumptions	Navy has not done a credible study on the effect of sonar on marine animals.	The Navy coordinated with NMFS. No long term or significant impacts to marine mammal populations are anticipated. The best available and most applicable science was used in the preparation of the EIS.
Earthjustice / Renshaw, Katie	NGO-019.18	Acoustic Modeling	Biological Assumptions	Removal of porpoises from assessment is subjective, as porpoises have a 'very low threshold of response' - indicative of selecting data to show minimal impact.	Please refer to Southall et al., 2007 for peer-reviewed analysis justifying the exclusion of porpoises. The best available and most applicable data was used in the preparation of the EIS, and has been reviewed objectively. The Navy coordinated with NMFS in all aspects of acoustic modeling.
Citizens Opposing Active Sonar Threats (COAST) / Wray, Russell	NGO-025.10	Acoustic Modeling	Biological Assumptions	Dismissing gas bubble growth as 'arguable' does not justify ignoring these potential effects.	Gas bubble growth is dismissed due to evidence presented in Subchapter 4.3.1.3.2.2 that marine mammals will not be exposed to levels of sound and parameters required for bubble growth.

Name/Agency	Letter Number	Comment Category	Comment Subcategory	Comments	Response
Citizens Opposing Active Sonar Threats (COAST) / Wray, Russell	NGO-025.13	Acoustic Modeling	Biological Assumptions	Dall's porpoises and Minke whale should have been included in data set, instead of being excluded.	Please refer to Southall et al., 2007 for peer-reviewed analysis justifying the exclusion of porpoises. The Navy coordinated with NMFS. No long term impacts are anticipated. The best available science was used in the preparation of the EIS. Minke whales were modeled in the analysis.
Citizens Opposing Active Sonar Threats (COAST) / Wray, Russell	NGO-025.14	Acoustic Modeling	Biological Assumptions	Use of risk function rather than the energy flux density level of 173 dB used by Navy off CA and HI appears to be solely for minimizing estimated behavioral harassment.	Risk assessment model was developed with NMFS using best available science; the model has been reviewed by scientists who are experts in this analysis. While recognizing there is incomplete and unavailable information with regard to behavioral impacts on marine mammals, the risk function curve extends to 120 dB SPL specifically to encompass uncertainty and the potential for behavioral reactions in marine mammal species that may be affected by sounds perceived at levels just above ambient in some areas during some parts of the year in east coast waters.
Citizens Opposing Active Sonar Threats (COAST) / Wray, Russell	NGO-025.15	Acoustic Modeling	Biological Assumptions	Modeling does not consider social nature of mammals, in that a single animal impacted may impact the entire group.	Please refer to discussion of analytical framework in Subchapter 4.3.1.3.4

Name/Agency	Letter Number	Comment Category	Comment Subcategory	Comments	Response
Citizens Opposing Active Sonar Threats (COAST) / Wray, Russell	NGO-025.18	Acoustic Modeling	Biological Assumptions	If 'most fish are hearing generalists,' then some are specialists, therefore, they should be included in acoustic analysis.	The Navy analyzed the effects of sonar on fish and anticipates no adverse effects to fish or fisheries. Please refer to Subchapter 4.3.11 and Popper, 2008 (available on the USWTR public Web site) discussion of sonar effects on fish.
Citizens Opposing Active Sonar Threats (COAST) / Wray, Russell	NGO-025.22	Acoustic Modeling	Biological Assumptions	Richardson et al (1995): manatee behavior is not necessarily a good indicator of effect. Beale and Monaga 2004: vulnerable animals may exhibit less dramatic behavior. Animals may endure noise at levels that are dangerous.	Please refer to Subchapter 4.3.7.2. for discussion. Manatees are not expected to come closer than approximately 45 mi to any sonar source; at this distance, sonar sound would be very low.
Citizens Opposing Active Sonar Threats (COAST) / Wray, Russell	NGO-025.23	Acoustic Modeling	Biological Assumptions	[vs. DEIS claim of no strong reaction] Nowacek et al. 2004: Manatees react to sound (of vessels) by moving to deeper waters or increasing swimming speed .	This comment references a different Nowacek et al. 2004 [Biological Conservation 119 (4): 517-523] than what is referenced in the EIS. Impact from moving vessels will not increase, as the Navy does not expect an overall increase in ship traffic due to USWTR due to planned reductions in ship traffic within the next five years.
Citizens Opposing Active Sonar Threats (COAST) / Wray, Russell	NGO-025.31	Acoustic Modeling	Biological Assumptions	Reduction in hearing (even temporarily) may impact a marine mammal's fitness. This imperils ESA-listed species.	The Navy is consulting with NMFS in accordance with Section 7 under ESA.

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Citizens Opposing Active Sonar Threats (COAST) / Wray, Russell	NGO-025.35	Acoustic Modeling	Biological Assumptions	Reverberation could extend exposure time considerably. Animals may become confused and remain in the sound field longer than expected.	Please refer to the acoustic effects analysis Subchapter 4.3.7 in the EIS on how exposure estimates were calculated. Distinct acoustic environments were modeled to account for various acoustic effects in the USWTR study area. Environments that could cause reverberation were included in the model.
Citizens Opposing Active Sonar Threats (COAST) / Wray, Russell	NGO-025.42	Acoustic Modeling	Biological Assumptions	Evidence from May 1996 stranding suggests affected whale was 25 km from sonar source, and received 150 dB. This is much less than 215 dB Level A threshold and far beyond the "safety zone".	Oceanographic factors that contributed this stranding event are not present any of the USWTR sites.
Citizens Opposing Active Sonar Threats (COAST) / Wray, Russell	NGO-025.50	Acoustic Modeling	Biological Assumptions	Prolonged exposure may also occur if: mammal travels with vessel, becomes disoriented, swims close to multiple sonar sources, or incurs injury due to initial exposure and reverberation.	Please refer to Subchapter 4.3.4.1. As indicated, prolonged exposure is unlikely as sonars have limited effect ranges and high platform speeds. Reverberations such as those that occurred in the 2000 Bahamas stranding event are unlikely to occur in the USWTR site due to different bathymetric features.

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Citizens Opposing Active Sonar Threats (COAST) / Wray, Russell	NGO-025.55	Acoustic Modeling	Biological Assumptions	DEIS does not adequately discuss masking effects, or considers reverberation-based extension of masking. Marine mammals use the frequency of sonar, and sonar can mask communication, even at low volumes.	The EIS discusses masking in Subchapter 4.3.1.3.1.2 - Perception. The sonar signals from the proposed USWTR active sonar activities are likely within the hearing range of some marine mammal species and may mask communication signals between individuals of the same species. Most of the sounds generated by USWTR active sonar activities have short pulse lengths (on the order of seconds), have low duty cycles (ping only one to a few times per minute), operate within a narrow band of frequencies (typically less than one-third octave), and are transient as a source passes through an area. Because of the intermittent nature and narrow frequency band of most of the sonar transmissions, marine mammals should still be able to hear biologically important sounds from other marine mammals, predators, and environmental cues. For this reason, the chance of sonar operations causing masking effects is considered negligible.
Citizens Opposing Active Sonar Threats (COAST) / Wray, Russell	NGO-025.75	Acoustic Modeling	Biological Assumptions	235 dB limit meaningless, as Navy can exceed for training purpose. Sonar used in 2000 Bahamas stranding was below 235 dB.	Sonar systems are operated at the lowest source levels to optimize their performance in the acoustic environment in which they are being used. It is not correct that the Bahamas report states that sonar levels were below 235 dB.

Name/Agency	Letter Number	Comment Category	Comment Subcategory	Comments	Response
Citizens Opposing Active Sonar Threats (COAST) / Wray, Russell	NGO-025.9	Acoustic Modeling	Biological Assumptions	Assumption that ear tissues are most sensitive to sound is currently debated. Hypothesis that gas bubble growth (due to sonar) has lead to injury and death.	Gas bubble (rectified diffusion) is addressed in Subchapters 4.3.1.3.2.2 and 4.3.1.3.2.3. Please refer to this text for an explanation of how exposure estimates were calculated.
Natural Resources Defense Council (NRDC)	NGO-026.20	Acoustic Modeling	Biological Assumptions	DEIS ignores bubble growth research, which is a potential cause of injury and death at a level far below thresholds.	Gas bubble (rectified diffusion) is addressed in Subchapters 4.3.1.3.2.2 and 4.3.1.3.2.3. Please refer to this text for an explanation of how exposure estimates were calculated.
Natural Resources Defense Council (NRDC)	NGO-026.22	Acoustic Modeling	Biological Assumptions	SPAWAR data does not represent range of wild marine mammal sensitivity, therefore it's extrapolation is not justified.	Please refer to the acoustic effects analysis Subchapter 4.3.7 in the EIS on how exposure estimates were calculated. Exposure limits are based on best available science and supported by NMFS. Recognizing there is incomplete and unavailable information with regard to behavioral impacts on marine mammals, the risk function curve extends to 120 dB SPL specifically to encompass uncertainty and the potential for behavioral reactions in marine mammal species that may be affected by sounds perceived at levels just above ambient in some areas during some parts of the year in east coast.

Name/Agency	Letter Number	Comment Category	Comment Subcategory	Comments	Response
Natural Resources Defense Council (NRDC)	NGO-026.23	Acoustic Modeling	Biological Assumptions	Pinnipeds species are found in area of USWTR sites, therefore their exclusion from analysis is not appropriate.	Based upon available research (compiled in the 2008 Marine Resource Assessments, available on the USWTR public Web site), pinnipeds are not expected to occur in the vicinity of the USWTR sites. Please refer to Subchapter 3.2.6 for further discussion.
Natural Resources Defense Council (NRDC)	NGO-026.24	Acoustic Modeling	Biological Assumptions	There are deficiencies in relying only on captive animal data for behavioral experiments. Data from studies involving wild animals is available should be used for proper analysis.	Please refer to the acoustic effects analysis Subchapter 4.3.7 in the EIS on how exposure estimates were calculated. Exposure limits are based on best available science and supported by NMFS. Recognizing there is incomplete and unavailable information with regard to behavioral impacts on marine mammals, the risk function curve extends to 120 dB SPL specifically to encompass uncertainty and the potential for behavioral reactions in marine mammal species that may be affected by sounds perceived at levels just above ambient in some areas during some parts of the year along the east coast.

Name/Agency	Letter Number	Comment Category	Comment Subcategory	Comments	Response
Natural Resources Defense Council (NRDC)	NGO-026.25	Acoustic Modeling	Biological Assumptions	Haro Strait data is that of the maximum level marine mammals were exposed to. Marine mammals were affected at much lower levels during the same incident. Propagation analysis in Haro Strait incident needed.	Haro Strait data presented in the EIS have been taken from the final report prepared by NMFS. A range of exposure estimates was determined for each 'ping' from the USS Shoup. The values used in the EIS represent the mean of that range, not the maximum. Researchers on the water with the animals at the time did note some apparent changes in behavior earlier in the event, although these are not reported (in the records provided to NMFS) as being nearly so pronounced as during the point of closest approach. Given the uncertainties, limited records, and differences of opinion, those exposures that seemed to clearly affect the behavior of the animals were used.
Natural Resources Defense Council (NRDC)	NGO-026.26	Acoustic Modeling	Biological Assumptions	DEIS should include data from 2004 Hanalei Bay beaching event. NMFS concluded that sonar was a likely cause of the event.	Data from the NMFS final report on the 2004 Hanalei Bay incident is presented in Appendix E.
Natural Resources Defense Council (NRDC)	NGO-026.27	Acoustic Modeling	Biological Assumptions	DEIS does not consider social ecology, as mass strandings can be caused by relatively few affected individuals.	Please refer to Subchapter 4.3.1.3.4.

Name/Agency	Letter Number	Comment Category	Comment Subcategory	Comments	Response
Natural Resources Defense Council (NRDC)	NGO-026.33	Acoustic Modeling	Biological Assumptions	Navy must revise modeling system and make it available to the public to comply with NEPA.	The CASS/GRAB model is classified; however, a discussion of the CASS/GRAB model along with the Navy and SAIC marine mammal acoustic exposure models are publicly available in the Center for Independent Experts (CIE) Report of December 2008. The CIE report is currently available to the public on the NMFS website with a link at the bottom of the following web page http://www.nmfs.noaa.gov/pr/permits/incidental.htm#applications. See the following pages in the CIE report for a discussion of CASS/GRAB propagation model: 6, 19, 31, 38 and 79.
Reynolds, Peter	P-012.2	Acoustic Modeling	Biological Assumptions	Humans are highly disturbed by 90 dB, and marine mammals are more sensitive than humans. The value of 195 dB for disturbance seems far too large.	The two values are for different mediums and sound types. Airborne noise metrics stated cannot be compared with underwater values due to differences in density between air and water. Please refer to Appendix C Subchapter C.4.1.2 regarding different reference pressures in air and in water. Please refer to Subchapters 4.3.1 and 4.3.2 for the acoustics criteria and regulatory framework. Risk function was conducted to 120 dB.
Reynolds, Peter	P-012.3	Acoustic Modeling	Biological Assumptions	Values in acoustic modeling seem highly suspect.	Please refer to the acoustic effects analysis Subchapter 4.3.7 in the EIS on how exposure estimates were calculated.

Name/Agency	Letter Number	Comment Category	Comment Subcategory	Comments	Response
Martin, Alison	P-014.1	Acoustic Modeling	Biological Assumptions	Available data on acoustical detection capabilities and behavioral responses to both fish and marine mammal species are insufficient. As such, additional data should be collected and measures employed to avoid interactions with marine life.	The Navy started a monitoring program in June 2007 at Site C; it includes passive acoustic and visual survey methods. A similar survey has begun at the Jacksonville USWTR site.
Martin, Alison	P-014.4	Acoustic Modeling	Biological Assumptions	During the project's proposed activities, the opportunity should not be missed to collect additional data on fish behavior (before and after testing) and mark and recapture studies to measure the impacts to fish as a result of sonar impacts.	The Navy will consider incorporating a study on the effects to fish within the future monitoring program.
Harbison, Candis M.	P-015.2	Acoustic Modeling	Biological Assumptions	The Navy has again failed to properly analyze the impacts of repeated use of mid-frequency sonar on marine creatures in the project area or adequately mitigate the harmful effects of sonar.	Navy will be implementing a monitoring program that would monitor potential effects to marine mammals and will provide a means of assessing mitigation effectiveness. The Navy supports a number of research efforts that are investigating potential effects of sonar on marine mammals. Pease refer to Subchapter 6.1.3 in the EIS.
Pillmore, Patricia J.	P-019.2	Acoustic Modeling	Biological Assumptions	Comment indicating that there is insufficient data to analyze potential impacts.	Please refer to the acoustic effects analysis in Subchapter 4.3.7 in the EIS, on how exposure estimates were calculated. The EIS represents the best available and most applicable science.

Name/Agency	Letter Number	Comment Category	Comment Subcategory	Comments	Response
Booher, Sam	P-040.5	Acoustic Modeling	Biological Assumptions	Assumptions of 'no significant effects' on fish and 'negligible effects' on marine mammals are suspect, and does not mean that there will be no impact.	Comment noted.
Booher, Sam	P-040.9	Acoustic Modeling	Biological Assumptions	The Navy has not conducted sufficient studies of the health or behavior effects of sonar on fish and mammals.	The Navy has recently funded research efforts to address the effects of sound on fish and will be implementing a monitoring program that would monitor potential effects to marine mammals. The Navy supports a number of research efforts that are investigating potential effects of sonar on marine mammals. Pease refer to Subchapter 6.1.3 in the EIS. The EIS represents the best available and most applicable science.
Zinn, Rob	P-057.3	Acoustic Modeling	Biological Assumptions	Level B disturbances beyond 300m should be considered, and more data should be collected to identify potential subtle effects beyond 300m.	Please refer to revised Subchapter 4.3.3.1.6 concerning distance to effects.
Tracy, Alison	P-064.1	Acoustic Modeling	Biological Assumptions	Risk management is not the best approach to USWTR, especially when dealing with endangered species.	Navy consulted with NMFS regarding potential impacts to endangered species and any required mitigation.

Name/Agency	Letter Number	Comment Category	Comment Subcategory	Comments	Response
Tracy, Alison	P-064.3	Acoustic Modeling	Biological Assumptions	Concerned that the research displayed is not extensive enough, and doesn't give enough consideration to unknowns.	The EIS represents the best available and most applicable science. While recognizing there is incomplete and unavailable information with regard to behavioral impacts on marine mammals, the risk function curve extends to 120 dB SPL specifically to encompass uncertainty and the potential for behavioral reactions.
VA Dept of Game and Inland Fisheries (VDGIF) / Ewing, Amy	S-015.6	Acoustic Modeling	Biological Assumptions	There are limitations in the acoustic modeling of thresholds. Model for PTS was based on terrestrial hearing, TTS data from one study of odontocetes only (no consideration of baleen whales). Data from trained mammals may not be applicable to wild. Nonconsideration of secondary effects of PTS, TTS. FEIS should address all evidence linking marine mammal mortality to active sonar.	Please refer to the acoustic effects analysis Subchapter 4.3.7 in the EIS on how exposure estimates were calculated. Exposure limits are based on best available science and supported by NMFS. Recognizing there is incomplete and unavailable information with regard to behavioral impacts on marine mammals, the risk function curve extends to 120 dB SPL specifically to encompass uncertainty and the potential for behavioral reactions in marine mammal species that may be affected by sounds perceived at levels just above ambient in some areas during some parts of the year along the east coast.

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FL Fish and Wildlife Conservation Commission (FFWCC) / Poole, Mary Ann	S-021.16	Acoustic Modeling	Biological Assumptions	Provide funding for research on the auditory characteristics of baleen whales, particularly right whales, as well as the physiological and behavioral responses to sounds. Estimates of thresholds for Temporary Threshold Shifts (TTS) and Permanent Threshold Shift (PTS) in the DEIS were largely conjecture because auditory characteristics of cetaceans, especially whales, are poorly studied. Further, behavioral responses of cetaceans to sound described in the DEIS were mainly derived from studies on captive animals (Schlundt *et al.* 2000, Finneran *et al.* 2001). Cetacean behavioral responses in the wild likely differ from those in captivity and additional studies of behavior in the wild, such as Nowacek *et al.* (2004), are needed. If any cetacean is inadvertently exposed to sonar during exercises, however, a full and thorough investigation	The Navy will implement a monitoring plan that would monitor potential effects to marine mammals and will provide a means of assessing mitigation effectiveness. The Navy supports a number of research efforts that are investigating potential effects of sonar on marine mammals. Pease refer to Subchapter 6.1.3 in the EIS.

Name/Agency	Letter Number	Comment Category	Comment Subcategory	Comments	Response
				should be conducted to evaluate impacts to the animal(s), contributing to the pool of information regarding TTS/PTS and behavioral responses of cetaceans.	
FL Fish and Wildlife Conservation Commission (FFWCC) / Poole, Mary Ann	S-021.18	Acoustic Modeling	Biological Assumptions	Refined information on auditory and behavioral characteristics of cetaceans in response to sound, together with a good model of sound propagation and detection of marine mammal locations would greatly improve the ability to understand and mitigate potential impacts of these types of Navy activities.	The Navy will implement a monitoring plan that would monitor potential effects to marine mammals and will provide a means of assessing mitigation effectiveness. The Navy supports a number of research efforts that are investigating potential effects of sonar on marine mammals. Pease refer to Subchapter 6.1.3 in the EIS.
Matthaei, Carl & Marcella	P-074.2	Acoustic Modeling	Biological Modeling	More research is required on the effects of low- and mid-range sonar on marine mammals, sea turtles and fish.	The EIS represents the best available and most applicable science, which indicates that fish and sea turtles cannot hear in the range of mid-frequency sonar. Low-frequency sonar will not be used during USWTR training. The Navy has funded research efforts to address the effects of sound on fish. The Navy supports a number of research efforts that are investigating potential effects of sonar on marine mammals. Please refer to Subchapter 6.1.3 in the EIS.

Name/Agency	Letter Number	Comment Category	Comment Subcategory	Comments	Response
Witter, William & Matthaei, Maru	P-075.2	Acoustic Modeling	Biological Modeling	More research is required on the effects of low- and mid-range sonar on marine mammals, sea turtles and fish.	The EIS represents the best available and most applicable science, which indicates that fish and turtles cannot hear in the range of mid-freq. sonar. Low-freq. sonar will not be used. The Navy has recently funded research efforts to address the effects of sound on fish and turtles, and will be implementing a monitoring program that would monitor potential effects to marine mammals. The Navy supports a number of research efforts that are investigating potential effects of sonar on marine mammals. Please refer to Subchapter 6.1.3 in the EIS.
Citizens Opposing Active Sonar Threats (COAST) / Wray, Russell	NGO-025.24	Acoustic Modeling	Reverberation	Limited activities in manatee habitat does not eliminate impacts.	Please refer to Subchapter 4.3.7.2. for discussion. Manatees are not expected to come closer than approximately 45 mi to any sonar source (see Subchapter 4.3.3.1.6); at this distance, sonar sound would be very low. The Navy is consulting with NMFS in accordance with Section 7 under ESA.
Citizens Opposing Active Sonar Threats (COAST) / Wray, Russell	NGO-025.52	Acoustic Modeling	Reverberation	Due to high intensity of sonar, noise may travel far, particularly if conditions (e.g. surface ducting) are 'favorable'.	All appropriate environmental conditions were considered when modeling for USWTR.

Name/Agency	Letter Number	Comment Category	Comment Subcategory	Comments	Response
Natural Resources Defense Council (NRDC)	NGO-026.30	Acoustic Modeling	Reverberation	Models do not account for reverberation.	Please refer to the acoustic effects analysis Subchapter 4.3.7 in the EIS on how exposure estimates were calculated. Distinct acoustic environments were modeled to account for various acoustic effects in the USWTR study area. Environments that could cause reverberation were included in the model.
Duke Environmental Law & Policy Clinic	NGO-012.19	Acoustic Modeling	Sonar Characteristics	Claim that USWTR will not impact species as it does not overlap their designated critical habitat is incomplete, as sonar has been shown to travel many miles underwater.	The Navy is coordinating with NMFS in accordance with the ESA and will coordinate under MMPA. Sonar effects over distances are described in Subchapter 4.3.3.1.6.
Cetacean Society International / Rossiter, William	NGO-014.9	Acoustic Modeling	Sonar Characteristics	As marine animals are near-impossible to locate, changing the sound of sonar may alleviate detrimental effects to animals beyond the PTS threshold.	Mitigation has been developed to minimize the potential for physiological effects. Prior to training on the range, the Navy will obtain a letter of authorization (LOA) for effects to marine mammals.
Sierra Club Florida / Bremer, Linda M.	NGO-021.2	Acoustic Modeling	Sonar Characteristics	Supports FFWCC suggestion to create a model of propagation of sound in shallow water,	The model used by the Navy for the analysis of sonar use at USWTR does account for water depth (see Subchapter 4.3.7).

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Natural Resources Defense Council (NRDC)	NGO-026.140	Acoustic Modeling	Sonar Characteristics	Navy must describe all noise sources (levels, frequency, ranges, etc), but has not provided information on dipping sonar, active sonobuoys, countermeasures, targets, range sources.	Please refer to Chapter 2, Table 2-2 and Appendix D.
Natural Resources Defense Council (NRDC)	NGO-026.31	Acoustic Modeling	Sonar Characteristics	Models do not consider synergistic effects of multiple sonars or multiple exercises.	These potential effects are addressed in Subchapter 4.3.3.1.8. By modeling individual sources and adding their footprints individually, the analysis slightly overestimates the number of exposures and therefore accounts for the cumulative effect of multiple systems operating simultaneously. Synergistic effects are not well-studied and can only be accounted for qualitatively.
Fried, Debra	P-001.2	Acoustic Modeling	Sonar Characteristics	Navy has not properly analyzed the use of mid-frequency sonar.	The EIS represents the best available and most applicable science.
Booher, Sam	P-002.3	Acoustic Modeling	Sonar Characteristics	Navy has not properly analyzed the use of mid-frequency sonar.	The EIS represents the best available and most applicable science.

Name/Agency	Letter Number	Comment Category	Comment Subcategory	Comments	Response
Eckert, Jaqueline	P-021.2	Acoustic Modeling	Sonar Characteristics	Navy has not properly analyzed the use of mid-frequency sonar on marine mammals.	The EIS represents the best available and most applicable science.
Earthjustice / Renshaw, Katie	NGO-019.16	Acoustic Modeling	Thresholds	DEIS does not support the threshold values for PTS, TTS; does not consider data that shows that damage can occur below those levels.	The EIS represents the best available and most applicable science and was prepared in cooperation with NMFS.
Earthjustice / Renshaw, Katie	NGO-019.17	Acoustic Modeling	Thresholds	Risk function curve is not supported by data and uses methodological steps that have no rational basis. Risk function may seriously underestimate actual risk (vs. other studies).	The Navy does not concur with this assessment. The risk assessment model was developed in coordination with NMFS using best available science; the model has been peer-reviewed by scientists who are experts in marine acoustic analysis. While recognizing there is incomplete/unavailable information with regard to behavioral impacts on marine mammals, the risk function curve extends to 120 dB SPL specifically to encompass uncertainty and the potential for behavioral reactions in marine mammal species that may be affected by sounds perceived at levels just above ambient in some areas during some parts of the year along the east coast.

Name/Agency	Letter Number	Comment Category	Comment Subcategory	Comments	Response
Earthjustice / Renshaw, Katie	NGO-019.19	Acoustic Modeling	Thresholds	Risk function improperly uses a mean of very different types of data.	Risk assessment model was developed in coordination with NMFS using best available science; the model has been peer-reviewed by scientists who are experts in marine acoustic analysis. While recognizing there is incomplete and unavailable information with regard to behavioral impacts on marine mammals, the risk function curve extends to 120 dB SPL specifically to encompass uncertainty and the potential for behavioral reactions in marine mammal species that may be affected by sounds perceived at levels just above ambient in some areas during some parts of the year along the east coast.
Earthjustice / Renshaw, Katie	NGO-019.20	Acoustic Modeling	Thresholds	NMFS considers a level just above 165 dB to be the level that triggers behavioral disturbance, disproving the '165 dB as 50% likelihood' presented in the DEIS.	The Navy does not concur with this comment. NMFS has not disproved the '165 dB as 50% likelihood.' Risk assessment model was developed in coordination with NMFS using best available science; the model has been peer-reviewed by scientists who are experts in marine acoustic analysis. NMFS is a cooperating agency on this OEIS/EIS and has provided the Navy guidance on the risk assessment model.

Name/Agency	Letter Number	Comment Category	Comment Subcategory	Comments	Response
Earthjustice / Renshaw, Katie	NGO-019.21	Acoustic Modeling	Thresholds	No explanation of why DEIS uses risk function rather than minimum level of exposure for harm. The risk function will reduce the estimate of harm without justification.	The analytical methodology used in this EIS was developed in close coordination with NMFS and has been peer-reviewed. The best available and most applicable science of effects to marine mammals from MFA/HFA sound sources was consulted and analyzed. Recognizing there is incomplete information with regard to behavioral impacts on marine mammals, the risk function curve extends to 120 dB SPL to encompass any uncertainty, and the potential for behavioral reactions in marine mammals that may be affected by sound just above ambient levels during some parts of the year along the east coast.
Earthjustice / Renshaw, Katie	NGO-019.22	Acoustic Modeling	Thresholds	Risk function improperly uses sound data for 'mammal did react' and uses the data as threshold where mammal 'would start to react.'	Risk assessment model was developed in coordination with NMFS using best available science; the model has been peer-reviewed by scientists who are experts in marine acoustic analysis.

Name/Agency	Letter Number	Comment Category	Comment Subcategory	Comments	Response
Citizens Opposing Active Sonar Threats (COAST) / Wray, Russell	NGO-025.12	Acoustic Modeling	Thresholds	Data from USS Shoup is a single mean from whales at the least distance, and does not include records of when the whales were further from the boat.	Data on the Haro Strait presented in the EIS has been taken from the final report prepared by NMFS. A range of exposure estimates was determined for each 'ping' from the USS Shoup. The values used in the EIS represent the mean of that range, not the maximum. Researchers on the water with the animals at the time did note some apparent changes in behavior earlier in the event, although these are not reported in the records provided to NMFS as being nearly so pronounced as during the point of closest approach. Given the uncertainties, limited records, and differences of opinion, those exposures that seemed to clearly affect the behavior of the animals were used.
Citizens Opposing Active Sonar Threats (COAST) / Wray, Russell	NGO-025.7	Acoustic Modeling	Thresholds	Thresholds set too high. Based on research on a small number of captive (habituated) animals of only select species (that may be less sensitive to sonar).	Please refer to the acoustic effects analysis Subchapter 4.3.7 in the EIS on how exposure estimates were calculated. The EIS represents the best available and most applicable science.
Citizens Opposing Active Sonar Threats (COAST) / Wray, Russell	NGO-025.90	Acoustic Modeling	Thresholds	Previous comments have rejected presented thresholds, they are obviously not "supported by the scientific community" (6-26).	The Temporary Threshold Shift and Permanent Threshold Shift used in the EIS were developed in coordination with NMFS using best available science; the model has been peer-reviewed by scientists who are experts in marine acoustic analysis.

Name/Agency	Letter Number	Comment Category	Comment Subcategory	Comments	Response
Natural Resources Defense Council (NRDC)	NGO-026.19	Acoustic Modeling	Thresholds	DEIS thresholds are too high and inconsistent with scientific data, legal standard, and recent court decisions. Maximum threshold for serious injury should be 182 dB for the proposed duration. Navy has previously used non-lethal; injury threshold of 173 dB.	The Navy does not concur with this comment. The Temporary Threshold Shift and Permanent Threshold Shift used in the EIS were developed in coordination with NMFS using best available science; the model has been peer-reviewed by scientists who are experts in marine acoustic analysis.
Natural Resources Defense Council (NRDC)	NGO-026.21	Acoustic Modeling	Thresholds	There should be two thresholds for behavioral effects, one based on [SELs] (sound exposure/pressure levels) and another based on ELs (energy flux density levels).	SEL is equivalent to EL. It was decided to use the term 'SEL' to be more consistent with the scientific community.
Natural Resources Defense Council (NRDC)	NGO-026.29	Acoustic Modeling	Thresholds	Use of current thresholds, based on the selected data, would violate NEPA.	The Navy and NMFS, in the role as regulator and as a cooperating agency, developed the risk function for analysis of impacts using the best available and applicable science. As described in Southall et al (2004) and as discussed in Subchapter 4.3, there is paucity of data upon which to base threshold criteria; however, the Navy is following the recommendations of NMFS and using the criteria established by NMFS through a process of scientific review and recommendation.

Name/Agency	Letter Number	Comment Category	Comment Subcategory	Comments	Response
Reynolds, Peter	P-012.1	Acoustic Modeling	Thresholds	Skepticism for methods and thresholds, and therefore skepticism of USWTR not impacting species through sonar.	Please refer to the acoustic effects analysis Subchapter 4.3.7 in the EIS on how exposure estimates were calculated.
GA Dept of Natural Resources (GADNR) / Holcomb, Noel	S-018.5	Acoustic Modeling	Thresholds	The maximum distance at which Level B harassment will occur from sonar sources is not provided in the DEIS/OEIS. This is particularly important given the proximity of the USWTR project area to the right whale calving ground. The Navy should address whether sonar energy will propagate from the USWTR and into areas inhabited by right whales. This information should be included in the Final EIS; it should also be considered by NMFS prior to issuing a LOA or consulting with the Navy under Section 7 of the ESA.	Please refer to the new Table 4.3-1 (Range Distance Table) The maximum distance sonar energy will travel is 147 km (approximately 80 nautical miles), but levels at this distance from the source are not expected to cause harassments. As detailed in the referenced table, harassments are expected to drop substantially at distances greater than 43.8 km (approximately 24 nautical miles) from the source.

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Citizens Opposing Active Sonar Threats (COAST) / Wray, Russell	NGO-025.4	Coastal Zone Management		As other state's coastal resources are impacted by USWTR due to inter-jurisdictional nature of marine resources, Consistency Determinations must be made for all states (FL, SC, NC, VA), regardless of which site is used. As ESA-listed species "may" be affected, in order to comply with CZMA, a Consistency Determination must be completed for Maine.	Coastal Consistency Determination (CCD) has been submitted for Florida, and a negative CCD has been submitted for Georgia, based on the current preferred alternative of Site A. CCDs will be prepared and submitted for South Carolina, North Carolina, Virginia, and/or Maryland if other alternatives are selected. None of the present USWTR alternatives are predicted to impact the waters of the state of Maine.
PenderWatch / Spruill, John R.	NGO-028.3	Coastal Zone Management		In 2004 the NC adopted the Coastal Habitat Protection Plan (CHPP), a comprehensive strategic plan with goals of protecting the coastal habitat. It was developed and implemented by Department of Environment and Natural Resources (DENR). Everything that is done concerning our coast is required to be in compliance with CHPP. The EIS does not even mention CHPP. I respectfully request that when the EIS is reissued as a second draft that the Navy commits to following the letter and spirit of CHPP.	The CHPP only applies to the coastal zone off the state of NC, does not directly apply to federal agencies. It is up to the state agencies to determine the applicability of the CHPP to a federal agency action. The Navy has determined, based upon the preferred alternative, that there is no impact to the NC coastal zone. Negative consistency determination will be followed.

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FL Department of Environmental Protection (FLDEP) / Griffin, Lynn (General)	S-020.19	Coastal Zone Management		Information presented here in incorrect and should be updated. The Florida Coastal Management Program (FCMP) is coordinated by the Florida Department of Environmental Protection (DEP) and is the lead coastal agency pursuant to Sections 380.22(1) and 403.061(40), *Florida Statues*. The FCMP was moved from Florida Department of Community Affairs to DEP in 2002. The state's federal consistency review is specified in Section 380.23, *Florida Statutes*.	The corrected information was included in Subchapter 3.7.1 of the FEIS.
Hines, Dwight	P-020.1	Cultural Resources		Concern for lack of consultation of a specialist in naval history, maritime archaeology, or statistics; despite EO 13089 directing the Navy to "ensure" that "heritage" is not degraded - which requires consultation of experts and empirical measures and tests.	The Navy is employing professionals to conduct the cultural resource components of this undertaking. In addition, the Navy is coordinating with Dr. Robert Neyland, Head of Underwater Archaeology for the Naval Historical Center. The EIS was sent, for review, to the clearinghouses of each state being considered as an alternative site. State historic preservation offices were able to review the project and made no comment.

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Hines, Dwight	P-020.10	Cultural Resources		The FEIS needs to definitively state that the USWTR will be available to researchers to collect future data.	The operation of USWTR would not restrict the future assessment of underwater archaeological resources within the site.
Hines, Dwight	P-020.2	Cultural Resources		The EIS did not consult a librarian from the Naval Library of History, Navy in-house sources, the Lighthouse Archaeological and Maritime Program (LAMP) or any similar organization and refers to only four primary references on shipwrecks within USWTR alternatives.	The information provided in the EIS presents the preliminary phase of cultural resource assessment. If additional investigations are requested during the Section 106 consultation, they will be conducted. At this time, the Navy has contacted its own expert, Dr. Robert Neyland, Head of Underwater Archaeology, for the Naval Historical Center.
Hines, Dwight	P-020.3	Cultural Resources		Proposes a study of distribution of shipwrecks within USWTR site, using spatial analysis to reveal historical patterns.	A bathymetric survey of the proposed trunk cable and range is being conducted using multi-beam sonar, which will allow for identification of shipwrecks present in the USWTR area. This information will be considered in the design of the range installation. The results of the bathymetric survey will be made available to the public. The analysis of shipwreck data, using spatial analysis, is not within the purpose and need of the project.

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Hines, Dwight	P-020.4	Cultural Resources		Sonar from USWTR could disrupt organisms that encapsulate (and preserve) portions of archaeological resources. The EIS does not report or conduct a single experiment or quasi-experiment on the effects of the USWTR on shipwrecks, artifacts, or saprophytic organisms.	Invertebrates were categorically eliminated from consideration from an acoustical perspective because mid-frequency sound of USWTR active sonar is not considered to be in the primary hearing register of invertebrate species that may posses the ability to sense sound (please refer to Subchapter 3.3.2.6). There is no documentation that indicates sonar impacts to structures.
Hines, Dwight	P-020.5	Cultural Resources		Proposes a study within the USWTR on the effects of sonar on organisms that live on (and potentially preserve) artifacts. Shipwrecks are potentially long-term study sites.	Sonar is not considered to be in the primary hearing register of invertebrate species that may posses the ability to sense sound.
Hines, Dwight	P-020.6	Cultural Resources		There is no mention in the DEIS of potential impacts of sonar or increased underwater traffic on artifacts. Non-concern of the impact of expended materials is unfounded, as no statistical assessment of the probability of materials striking underwater artifacts has been made.	There is no documentation that indicates the sonar impacts structures. The location of underwater obstructions within USWTR will be documented; submarines will avoid any direct impacts with shipwrecks. The very small amount of debris that would be expended is not anticipated to damage any underwater artifacts, or adversely affect historic resources in the context of Section 106 of the National Historic Preservation Act.

Name/Agency	Letter Number	Comment Category	Comment Subcategory	Comments	Response
Hines, Dwight	P-020.7	Cultural Resources		Individual shipwrecks, and the overall distribution of shipwrecks, qualify for listing on the National Historic Register, and the Navy will need to increase study of the alternative sites.	If during consultation with SHPO, additional studies are recommended to determine the eligibility of shipwrecks for listing on the National Register of Historic Properties, the Navy will conduct the requested studies.
Hines, Dwight	P-020.8	Cultural Resources		The two references in the DEIS on shipwrecks, NOAA's AWOIS and Captain Segull (2004) are charts, and do not contain any information on the historical value of shipwrecks.	The Navy's identification of shipwrecks does not rely solely on these sources of information. Please refer to the revised Subchapter 3.5. The survey of the area proposed for installation of the underwater components of the USWTR will identify the shipwrecks in the proposed area.
Hines, Dwight	P-020.9	Cultural Resources		Shipwrecks increase in value with time, as such, records of expended materials must be maintained to minimize unknown impacts on shipwrecks.	Comment noted. The very small amount of debris that would be expended is not anticipated to damage any underwater artifacts, or adversely affect historic resources in the context of Section 106 of the National Historic Preservation Act.
Hines, Dwight	P-089.1	Cultural Resources		DEIS does not consult any experts on cultural resources, despite presence of 100s of sunken ships in area. DEIS does not meet legal criteria for project.	The Navy is employing professionals to conduct the cultural resource components of this undertaking, and is coordinating with SHPO, and Dr. Robert Neyland, Head of Underwater Archaeology for the Naval Historical Center. The EIS was sent, for review, to the clearinghouses of each state being considered as an alternative site. State historic preservation offices were able to review the project and made no comment.

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VA Dept of Historic Resources / Jefferson, A.	S-010.1	Cultural Resources		No known historic properties will be affected by this undertaking.	Comment noted.
Duke Environmental Law & Policy Clinic	NGO-012.15	Cumulative Impacts		TEWG has noted a 40% decline in loggerhead nests since 1998. The cause is unknown, but USWTR will contribute increased ship traffic and underwater noise pollution (shown to affect behavior of turtles).	The recently-released Mayport ROD announced that the number of Navy ships based in Mayport is expected to decline from 22 to 12, by 2014; which will reduce Navy traffic, and is predicted to offset any increases due to USWTR. The Navy has consulted with NMFS under the ESA with regard to potential impacts of USWTR. The Navy has incorporated protective measures to reduce the potential for ship strikes (refer to revised Chapter 6). Based on best available science, turtles cannot perceive mid-frequency sonar, please refer to Subchapter 3.3.2.3.
Duke Environmental Law & Policy Clinic	NGO-012.16	Cumulative Impacts		14.9% of stranded turtles have sustained a ship strike injury. Navy vessels will increase traffic, likely resulting in increased strikes.	The Navy has incorporated protective measures in an attempt to reduce the potential for ship strikes to both marine mammals and turtles (refer to revised Chapter 6). Use of USWTR will not increase Navy vessel traffic. The recently-released Mayport ROD announced that the number of Navy ships based in Mayport is expected to decline from 22 to 12, by 2014. The Navy has consulted with NMFS under the ESA with regard to potential impacts to sea turtles.

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Duke Environmental Law & Policy Clinic	NGO-012.26	Cumulative Impacts		Climate change may alter species distribution, and lower pH of ocean water, which could cause sounds to become enhanced as much as 20% (Hester et al., 2008). This must be considered, according to NEPA.	Please refer to the revised Subchapter 4.8.5.1 and 4.8.6.1 for included text on the effects of climate change on distribution, and Subchapter 4.3 for text about sound propagation.
Southern Environmental Law Center / Wannamaker, Catherine M.	NGO-017.51	Cumulative Impacts		DEIS cumulative impact analysis is flawed, vaguely claiming only 'short-term impacts.' Provides no information on duration or extent of impact, and no information on aggregate of activities over long-term.	Please refer to revised text in Subchapter 4.8 for expanded discussion of cumulative impacts.
Southern Environmental Law Center / Wannamaker, Catherine M.	NGO-017.52	Cumulative Impacts		DEIS doesn't consider possible synergistic effects of USWTR impacts with impacts of other activities in the area.	Please refer to revised text in Subchapter 4.8.
Southern Environmental Law Center / Wannamaker, Catherine M.	NGO-017.53	Cumulative Impacts		Cumulative impacts on right whales are hazardous to species survival, as they migrate several times during their life. Cumulation of non-lethal stresses from aspects of USWTR (sonar, vessel activity, debris) and other activities could be lethal	The Navy coordinated with NMFS on all potential impacts to right whales. Please refer to revised text in Subchapter 4.8.

Name/Agency	Letter Number	Comment Category	Comment Subcategory	Comments	Response
Southern Environmental Law Center / Wannamaker, Catherine M.	NGO-017.54	Cumulative Impacts		Cumulative effect of discarding of materials not considered, DEIS instead views single discardings as minor impacts.	The revised Subchapter 4.1.1.3 discusses the long-term effects of discarding materials; retrieval of these materials could have negative environmental impacts on surrounding habitat.
Southern Environmental Law Center / Wannamaker, Catherine M.	NGO-017.55	Cumulative Impacts		DEIS fails to include analysis of potential impacts of reasonably foreseeable future actions on the USWTR.	Please refer to revised text in Subchapter 4.8.
NY Whale and Dolphin Action League / Williams, Taffy	NGO-018.6	Cumulative Impacts		USWTR has only negative effects on local ecosystem and an economy that is already in decline.	The Navy does not concur with this statement.
Earthjustice / Renshaw, Katie	NGO-019.12	Cumulative Impacts		Sea turtles may be impacted by ship noise and explosion-related noise from USWTR training.	Given the current ambient sound levels in the marine environment, the amount of sound contributed by the use of Navy vessels in the proposed exercises is very low (see Subchapter 4.3.10). Please refer to Chapter 2; there are no explosives used during USWTR training, and no explosive sounds will be produced.
Earthjustice / Renshaw, Katie	NGO-019.23	Cumulative Impacts		No consideration of cumulative impact to marine mammals in any part of DEIS.	Please refer to revised text in Subchapter 4.8

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Earthjustice / Renshaw, Katie	NGO-019.37	Cumulative Impacts		Cumulative impact (4.8) fails to meet basic requirements of a EIS. Analysis is simply listing other activities, and does not acknowledge overall impact.	Please refer to revised text in Subchapter 4.8
Earthjustice / Renshaw, Katie	NGO-019.38	Cumulative Impacts		Navy conclusion of no significant cumulative impact has no support or explanation.	Please refer to revised text in Subchapter 4.8
PenderWatch & Conservancy / Anonymous	NGO-023.2	Cumulative Impacts		Concern for how sonar would impact structures if offshore drilling were to take place in the area.	There is no evidence of sonar impact to structures. Oil exploration would not be compatible with USWTR instrumentation.
Citizens Opposing Active Sonar Threats (COAST) / Wray, Russell	NGO-025.28	Cumulative Impacts		DEIS doesn't adequately consider stress of USWTR activities. Short-term disruptions can lead to long-term reduction in fitness.	The Navy coordinated with NMFS on the effects of stress from the cumulative activities of USWTR.
Citizens Opposing Active Sonar Threats (COAST) / Wray, Russell	NGO-025.53	Cumulative Impacts		Addition of even low levels of sonar will increase stress due to other anthropogenic impacts (acoustic & non-acoustic).	The Navy coordinated with NMFS on the effects of stress from the cumulative activities of USWTR.

Name/Agency	Letter Number	Comment Category	Comment Subcategory	Comments	Response
Citizens Opposing Active Sonar Threats (COAST) / Wray, Russell	NGO-025.54	Cumulative Impacts		DEIS does not adequately discuss effects of stress from USWTR.	The Navy coordinated with NMFS on the effects of stress from the cumulative activities of USWTR.
Citizens Opposing Active Sonar Threats (COAST) / Wray, Russell	NGO-025.66	Cumulative Impacts		Todd et al. (1996): hearing impairment may increase the chance of marine mammals becoming entangled in fishing gear or USWTR equipment.	The animals affected in the Todd et al. 1996 study were humpback whales exposed to underwater explosions, drilling, and dredging noise. The authors suggest that hearing impairment from the explosive activities could have resulted, preventing whales from hearing acoustic alarms on the fishing nets; or that the drilling/dredging noise could have acted as effective maskers of the net alarms (or both acting in conjunction). Conditions at the proposed USWTR do not resemble those encountered in the Todd et al. 1996 study: No equipment at the proposed USWTR would be similar to fishing nets, nor would they have or require acoustic alarms. Furthermore, humpback whales are believed to be most sensitive to lower frequencies, not the mid- to high-frequency range at which sources in the USWTR are operated.

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Citizens Opposing Active Sonar Threats (COAST) / Wray, Russell	NGO-025.68	Cumulative Impacts		Toxic and acoustic impacts on prey species may affect higher trophic levels.	Comment noted. Analyses presented in Subchapter 3.3.2 predict that invertebrates and fish (the most common prey species) will not be impacted by USWTR acoustics. The only hazardous waste that could be discarded is fuel from exercise torpedoes (discussed in Subchapter 4.1.2.2) which will be kept at a low concentration in the highly unlikely event that the fuel would be released. No significant leaching of toxins from discarded materials is expected.
Citizens Opposing Active Sonar Threats (COAST) / Wray, Russell	NGO-025.92	Cumulative Impacts		DEIS inadequately investigates impact of multiple noise sources (including lower level sources), and interaction of acoustic and non-acoustic impacts.	Please refer to revised text in Subchapter 4.8 and Subchapter 4.3.3.1.8 for discussion on modeling of multiple ships operating together. By modeling individual sources and adding their footprints individually, the analysis slightly overestimates the number of exposures and therefore accounts for the cumulative effect of multiple systems operating simultaneously. Synergistic effects are not well-studied and can only be accounted for qualitatively.
Citizens Opposing Active Sonar Threats (COAST) / Wray, Russell	NGO-025.93	Cumulative Impacts		DEIS lists other actions that will or are already affecting the same environment, but doesn't discuss combined effects (as required by NEPA).	Please refer to revised text in Subchapter 4.8.

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Natural Resources Defense Council (NRDC)	NGO-026.135	Cumulative Impacts		Navy does not offer support of the conclusions of 'no significant cumulative impact' in analyses.	The Navy coordinated with NMFS as to the full scope of potential impacts. Please refer to revised text in Subchapter 4.8.
Natural Resources Defense Council (NRDC)	NGO-026.136	Cumulative Impacts		Behavioral impacts may be long-term impacts, especially with multiple exposures.	The Navy coordinated with NMFS as to the full scope of potential impacts. Please refer to revised text in Subchapter 4.8 and Subchapter 4.3.4.
Natural Resources Defense Council (NRDC)	NGO-026.137	Cumulative Impacts		DEIS doesn't consider cumulative effects for any species other than marine mammals and sea turtles, nor does it consider specific populations of the species it does consider.	Based upon acoustic screening of marine species, invertebrates, sea turtles, and sea birds were excluded from further analysis from an acoustic perspective (see Subchapter 3.3.2). Subchapter 4.3.11 addresses the effects of sonar on fish. Please refer to revised text in Subchapter 4.8, including the expanded discussion on predicted cumulative impacts. The EIS represents the best available and most applicable science; there is little data available on separate populations of species. Impacts to marine species during installation of the range equipment are addressed in Subchapter 4.2.

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Natural Resources Defense Council (NRDC)	NGO-026.138	Cumulative Impacts		DEIS does not consider the synergistic effects of sonar training.	By modeling individual sources and adding their footprints individually, the analysis slightly overestimates the number of exposures and therefore accounts for the cumulative effect of multiple systems operating simultaneously. Synergistic effects are not well-studied and can only be accounted for qualitatively.
Natural Resources Defense Council (NRDC)	NGO-026.139	Cumulative Impacts		DEIS acknowledges other human activities, but implausibly concludes that insignificant cumulative effects are anticipated.	EIS conclusions are based upon analyses using the best available and most applicable science.
Natural Resources Defense Council (NRDC)	NGO-026.2	Cumulative Impacts		DEIS does not properly analyze cumulative impacts, dismissing most impacts as 'short-term'.	EIS conclusions are based upon analyses using the best available and most applicable science. Please refer to revised text in Subchapter 4.8.
Natural Resources Defense Council (NRDC)	NGO-026.28	Cumulative Impacts		DEIS does not consider how seemingly insignificant or subtle impacts may become significant if experienced repeatedly.	Please refer to text in Subchapter 4.3.4 regarding long-term effects because of repeated, prolonged exposures and the revised text in Subchapter 4.8 regarding cumulative effects.
Natural Resources Defense Council (NRDC)	NGO-026.32	Cumulative Impacts		Model assumes that every whale is a 'new whale', does not consider cumulative impacts of multiple exposures on behavior and stocks.	Please refer to text in Subchapter 4.3.4 regarding long-term effects because of repeated, prolonged exposures and the revised text in Subchapter 4.8 regarding cumulative effects.

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Natural Resources Defense Council (NRDC)	NGO-026.70	Cumulative Impacts		DEIS does not consider the effects of stress on marine mammals, and how it can effect them with regard to behavior, development, and fitness.	Please refer to text in Subchapter 4.3.1.3.3 regarding the effects of stress on marine mammals.
Natural Resources Defense Council (NRDC)	NGO-026.71	Cumulative Impacts		DEIS does not consider the increased risk of marine mammal ship collisions when sonar is being used, due to surfacing reaction.	The subject of ship strikes is discussed in Subchapter 4.2.4.4 and Appendix E with the relevant literature cited. No incidences have been reported of sonar causing marine mammals to react by surfacing and then subsequently colliding with ships. Discussion of such an event would be speculative as no data to support the notion that there is an increased risk of ship strike associated with mid-frequency active (MFA) sonar exist.
Natural Resources Defense Council (NRDC)	NGO-026.72	Cumulative Impacts		DEIS does not discuss cumulative effects of toxic chemicals released due to USWTR activities on the environment and human health. Claim of 'insufficient information' does not satisfy NEPA.	Please refer to revised text in Subchapter 4.1.2, Subchapter 4.8.4.7 and Subchapter 4.8.4.8.
Natural Resources Defense Council (NRDC)	NGO-026.73	Cumulative Impacts		DEIS must consider indirect effects of USWTR activities.	Please refer to revised text in Subchapter 4.8.6.

Name/Agency	Letter Number	Comment Category	Comment Subcategory	Comments	Response
Hill, David	P-042.3	Cumulative Impacts		Impacts include those of concentrated human activity and maintenance of infrastructure.	Comment noted.
Armstrong, Frances T.	P-069.1	Cumulative Impacts		DEIS should be revised to include an in-depth analysis of sonar's cumulative impacts on the marine environment - including all marine life and all future military activities.	Please refer to revised text in Subchapter 4.8.
Armstrong, Frances T.	P-069.5	Cumulative Impacts		DEIS fails to include cumulative impacts of actions on sea turtles, fish, and marine environment.	Please refer to revised text in Subchapter 4.8.
ten Hulzen, Kalinke	P-072.3	Cumulative Impacts		Concern for cumulative effects on turtles, fish and environment.	Please refer to revised text in Subchapter 4.8.
Davis, Susan	P-076.2	Cumulative Impacts		DEIS does not address cumulative impacts of USWTR.	Please refer to revised text in Subchapter 4.8.

Name/Agency	Letter Number	Comment Category	Comment Subcategory	Comments	Response
Burroughs, Karen	P-093.1	Cumulative Impacts		Sea life is already under pressure from anthropogenic activities.	Comment noted.
Vincent, Shirley	P-104.2	Cumulative Impacts		Urges USWTR not be built due to cumulative impacts of previous and current impacts.	Please refer to revised text in Subchapter 4.8. USWTR would have a minor impact on the ocean ecosystem.
North Carolina Wildlife Resources Commission (NCWRC) / Dunn, Maria T.	S-005.3	Cumulative Impacts		There should be more discussion of cumulative impacts (from project + other operations) during the life of this project.	Please refer to revised text in Subchapter 4.8.
VA Dept of Game and Inland Fisheries (VDGIF) / Ewing, Amy	S-015.8	Cumulative Impacts		Concern that USWTR could be used for other forms of training, increasing the intensity of use in the near future.	Some anti-submarine warfare (ASW) training events may coincide with exercise activity conducted elsewhere in the Jacksonville OPAREA. Other than ASW training on the range (see Subchapter 2.2.2), the existence of USWTR will not change the patterns of future training.

Name/Agency	Letter Number	Comment Category	Comment Subcategory	Comments	Response
GA Dept of Natural Resources (GADNR) / Holcomb, Noel	S-018.6	Cumulative Impacts		If sound is likely to propagate from the USWTR and into the right whale calving grounds, the potential for cumulative negative impacts on individual right whales and their habitat should be considered. Breeding females return to the waters off Georgia and northeast Florida every 3-5 years to calve. Immature right whales often return to the calving grounds each winter during the first few years of their lives. These individual whales may remain in waters off Georgia and Florida for extended periods (3-4 months). As such, the potential for cumulative impacts on individual whales should not be discounted.	The Navy consulted with National Marine Fisheries Service, who is a cooperating agency on the EIS. Please refer to Chapter 4.8 regarding the assessment of cumulative impacts.

Name/Agency	Letter Number	Comment Category	Comment Subcategory	Comments	Response
FL Department of Environmental Protection (FLDEP) / Griffin, Lynn (General)	S-020.6	Cumulative Impacts		From the table presented, it appears that the USWTR will have almost constant use. Was this accounted for when analyzing the possible effects on coastal and marine resources? Will this significantly increase the amount of ship traffic coming out of Jacksonville on a daily basis, if so, how much? Could this increased traffic affect the areas of known North Atlantic right whale habitat?	The frequent use of the USWTR was accounted for when analyzing the effects to coastal and marine resources. It is not anticipated that ship traffic out of Naval Station Mayport would increase as a result of the construction of the USWTR, as these same ships are already transiting the right whale critical habitat to train out at sea.
FL Department of Environmental Protection (FLDEP) / Griffin, Lynn (General)	S-020.40	Cumulative Impacts		This section should be updated to include the two LNG projects off of Ft. Lauderdale, FL: proposed Calypso Deepwater Port and AES LNG Pipeline.	This information has been added to Subchapter 4.8.

Name/Agency	Letter Number	Comment Category	Comment Subcategory	Comments	Response
FL Department of Environmental Protection (FLDEP) / Griffin, Lynn (General)	S-020.41	Cumulative Impacts		Once habitat surveys are concluded cumulative effects should be reanalyzed. There is such limited data on the benthic habitat of the proposed area that a valid conclusion may not be possible without the additional data being included. In order to properly evaluate cumulative impacts, complete data for benthic resource impacts is needed.	All significant new information will be considered. The best available and most applicable science has been, and will continue to be, used. The data from the benthic survey will not be available in time for the publication of the FEIS.
Office of the Mayor of Jacksonville / McCarthy, Julian	L-001.4	Fish	Distribution	Great white sharks occur in the Jacksonville USWTR area only in Dec-Feb.	Comment noted.
Southern Environmental Law Center / Wannamaker, Catherine M.	NGO-017.39	Fish	Distribution	DEIS claim of no impact to fish during installation is unsupported. As installation will involve damage to bottom habitat, consultation with NMFS required.	The Navy is currently undertaking consultation with NMFS in accordance with the Magnuson-Stevens Fishery Conservation and Management Act. Area of impact to bottom habitat is insignificant (please refer to Subchapter 4.1 and 4.2). Impacts to nearshore habitats will be eliminated by directional drilling, and pre-construction mapping will enable planning a route to minimize impact to fish habitat further offshore.

Name/Agency	Letter Number	Comment Category	Comment Subcategory	Comments	Response
Southern Environmental Law Center / Wannamaker, Catherine M.	NGO-017.41	Fish	Distribution	North Florida Snapper-Grouper MPA is incompatible with Jacksonville USWTR activity and debris. Analysis of effect of USWTR on MPA required.	The Navy is currently coordinating with NMFS concerning the placement of the USWTR range in relation to the proposed marine protected area (MPA).
Earthjustice / Renshaw, Katie	NGO-019.15	Fish	Distribution	DEIS does not cite best available data regarding vulnerability of each fish species occurring in USWTR sites.	Please refer to the updated Subchapter 3.2.8.1.2 which includes a complete list of species of concern expected to occur within the USWTR ranges and trunk cable corridors.
Kauskis, Ed	P-063.5	Fish	Distribution	All fish data seems to be from South Florida, surveys of the actual range area should be done before installation to give an accurately characterize the community.	The Navy is conducting hydrographic and bottom mapping surveys at the Jacksonville site. These data will be used to identify and avoid, to the extent possible, critical fish habitat areas.
Neal, Tyler	P-087.1	Fish	Distribution	[Charleston?] USWTR site is over three main South Carolina offshore fishing areas. Fish migrate through along the shelf drop-off.	Currently, the Jacksonville USWTR is the preferred site, but if the Charleston USWTR is chosen, the Navy anticipates no adverse effects to commercial or recreational fishing as a result of range activities. Please refer to Subchapter 4.2.2 on ecological impacts to fish and Subchapter 4.4.2 and 4.4.3 on impacts to commercial and recreational fishing. Training on the range will not restrict access to this area by fishermen.

Name/Agency	Letter Number	Comment Category	Comment Subcategory	Comments	Response
NC Marine Fisheries Commission / Currin, Mac	S-008.1	Fish	Distribution	Jacksonville alternative could still impact NC fisheries, including the Snapper Grouper complex (managed through the NC [Inter-jurisdictional] FMP).	The Navy anticipates no adverse effects to fish or fisheries as a result of range activities. Please refer to Subchapter 4.2.2 on ecological impacts to fish and Subchapter 4.4.2 and 4.4.3 on impacts to commercial and recreational fishing.
PenderWatch & Conservancy / Spruill, John R.	NGO-004.5	Fish	Sonar	The DEIS inadequately discusses the effects of USWTR (sonar, ship propeller cavitation, and other ship noises) on all finfish life cycle stages.	Refer to Subchapter 4.2.2 on ecological impacts to fish and Subchapter 4.4.2 and 4.4.3 on impacts to commercial and recreational fishing. Subchapter 4.3.11 and Popper 2008 (available on USWTR public Web site) address potential impacts of sonar on fish.
Southern Environmental Law Center / Wannamaker, Catherine M.	NGO-017.45	Fish	Sonar	DEIS conclusion of no significant impact to fish by sonar is not supported by evidence.	The Navy analyzed the effects of sonar on fish and anticipates no adverse effects to fish. Please refer to Subchapter 4.3.11 and Popper 2008 (available on USWTR public Web site) on sonar effects to fish.
Earthjustice / Renshaw, Katie	NGO-019.14	Fish	Sonar	DEIS conclusion of no significant impact to fish by sonar is not supported by evidence. DEIS considers data that fish can be impacted by sonar (hearing or physiologically), but dismisses it.	The Navy analyzed the effects of sonar on fish and anticipates no adverse effects to fish. Please refer to Subchapter 4.3.11 and Popper 2008 (available on USWTR public Web site) on sonar effects to fish.

Name/Agency	Letter Number	Comment Category	Comment Subcategory	Comments	Response
Natural Resources Defense Council (NRDC)	NGO-026.12	Fish	Sonar	Hearing loss and behavioral disruption is seen in fish exposed to sonar.	The Navy analyzed the effects of sonar on fish and anticipates no adverse effects to fish. Please refer to Subchapter 4.3.11 and Popper 2008 (available on USWTR public Web site) on sonar effects to fish.
Natural Resources Defense Council (NRDC)	NGO-026.74	Fish	Sonar	Fish utilize sound for same purposes marine mammals do.	Comment noted. The Navy analyzed the effects of sonar on fish and anticipates no adverse effects to fish. Please refer to Subchapter 4.3.11 and Popper 2008 (available on USWTR public Web site) on sonar effects to fish.
Natural Resources Defense Council (NRDC)	NGO-026.75	Fish	Sonar	Airgun study showed sound causing temporary or permanent hearing loss.	The airgun produces an impulse sound that is more intense and extends over a broader range of frequencies than MFA. The Navy analyzed the effects of sonar on fish and anticipates no adverse effects to fish. Please refer to Subchapter 4.3.11 and Popper, 2008 (available on USWTR public Web site) on sonar effects to fish. The Navy continues to fund research efforts to address the effects of sound on fish.

Name/Agency	Letter Number	Comment Category	Comment Subcategory	Comments	Response
Natural Resources Defense Council (NRDC)	NGO-026.76	Fish	Sonar	Even at moderate levels, motor noise can deafen fish. For any fish dependant on sound, hearing loss will reduce fitness.	Although engine, machinery, and propeller noise from Navy vessels (vessel noise) has a low frequency component and is therefore within the hearing range of many marine fish species, it was concluded that the sound would likely not cause a significant effect to individual fish, and be less likely to effect the population; due to the following reasons: 1) The exposure to vessel noise would be short term and infrequent at any given place on the range as the ships move about a 500nm2 area. 2) The distance between the surface of the water and the bottom allows the sound to attenuate greatly before potentially reaching benthic fish species near the bottom. and 3) Navy vessels, especially submarines are designed to be quiet in comparison with commercial vessels, to avoid detection, which will mitigate the effect to marine species.
Natural Resources Defense Council (NRDC)	NGO-026.77	Fish	Sonar	Intense noise can impact fisheries by either reducing or displacing stocks from their usual grounds.	This has only been shown for seismic surveys using airguns. Seismic airguns produce low-frequency sound, which, unlike MFA sonar, is audible by most marine fish species.

Name/Agency	Letter Number	Comment Category	Comment Subcategory	Comments	Response
Natural Resources Defense Council (NRDC)	NGO-026.78	Fish	Sonar	East coast fishermen reported reductions in catch after Navy exercises in 2005 DEIS comments.	It is not possible to account for this incident as there is not enough information available, however there are many reasons that fishing success fluctuates. The reported incident was during a billfish tournament, and little is known about billfish hearing. However, the tuna species, another large pelagic game fish, is a hearing generalist, unable to detect mid-frequency sounds.
Natural Resources Defense Council (NRDC)	NGO-026.79	Fish	Sonar	Sonar could affect breeding behavior, including ceasing 'spawning choruses', which could reduce reproduction.	Spawning choruses have specifically been reported for sciaenids, which could be present on the proposed range. One study showed that spawning choruses of silver perch (a sciaenid) did decrease when bottlenose dolphin whistles (which are mid-frequency sounds) were played back, but it is unclear what component of the playback caused this response.
Natural Resources Defense Council (NRDC)	NGO-026.80	Fish	Sonar	High energy noise can disrupt development, or cause increased mortality in developing fish.	The Navy continues to fund research efforts to address the effects of sound on fish. The best available and most applicable science was used in the development of the EIS.

Name/Agency	Letter Number	Comment Category	Comment Subcategory	Comments	Response
Martin, Alison	P-014.2	Fish	Sonar	The data presented in the EIS pertaining to fish audio capabilities is incomplete. The referenced studies (in the EIS) are based upon the capabilities of only 0.35 percent of fish species. Moreover, the DEIS acknowledges the behavioral effects of human-generated noise in unclear and that the information that is available is based on air guns - not sonar systems.	The Navy continues to fund research efforts to address the effects of sound on fish. The best available and most applicable science was used in the development of the EIS.
Booher, Sam	P-040.15	Fish	Sonar	Scientific studies show that sonar can cause physical and behavioral impacts on fish, which could affect fisheries.	The EIS represents the best available and most applicable science. The Navy analyzed the effects of sonar on fish and anticipates no adverse effects to fish or fisheries. Please refer to Subchapter 4.3.11 and Popper 2008 (available on USWTR public Web site) on sonar effects to fish, and Subchapter 4.4.2 -3 on impacts to commercial and recreational fishing.

Name/Agency	Letter Number	Comment Category	Comment Subcategory	Comments	Response
Alsentzer, Mary and Ulrich	P-066.5	Fish	Sonar	DEIS has not adequately addressed impact of sonar, explosives and propeller cavitation; and hard bottom destruction on finfish in all life stages.	Explosives are not part of the proposed action. Hardbottom destruction is minimal and is being further avoided/minimized by extensively mapping the bottom habitat in the proposed range area. Although engine, machinery, and propeller noise from Navy vessels (vessel noise) has a low frequency component and is therefore within the hearing range of many marine fish species, it was concluded that the sound would likely not cause a significant effect to individual fish, and even less likely to the population, due to the following reasons:1) The exposure to vessel noise would be short term and infrequent at any given place on the range as the ships move about a 500nm2 area. 2) The distance between the surface of the water and the bottom allows the sound to attenuate greatly before potentially reaching benthic fish species near the bottom. and 3) Navy vessels, especially submarines are designed to be quiet in comparison with commercial vessels, to avoid detection, which also mitigates the effect to marine species.

Name/Agency	Letter Number	Comment Category	Comment Subcategory	Comments	Response
Neal, Tyler	P-087.2	Fish	Sonar	Loss of hearing may cause fish to disperse from fishing ground or impact effectiveness of bait.	Most marine fish are hearing generalists, cannot hear MF sound, and are therefore unlikely to be able to receive TTS (Temporary Threshold Shift: a temporary, recoverable, loss in hearing sensitivity). In experiments, TTS in fish has only been induced with long-term exposure, or short-term exposure to an intense sound. It is unlikely that any individuals would experience TTS from the sound generated during ASW exercises.
North Carolina Division of Marine Fisheries (NCDMF) / Duval, Michelle	S-006.3	Fish	Sonar	Disagree with conclusion that there will be no impact to fish populations due to sonar. References all deal with goldfish (not marine species), and subtle effects of stress not considered. More research is required on this topic before a conclusion can be reached.	Stress in fish has been studied in a few species besides goldfish such at Atlantic salmon and rainbow trout. Most marine fish cannot detect MFAS.
North Carolina Division of Marine Fisheries (NCDMF) / Duval, Michelle	S-006.5	Fish	Sonar	Navy-sponsored workshop in April 2007 discussed research, on mid-frequency sonar's effect on fish, fish habitat, and fisheries; crucial to the DEIS/OEIS. A progress report of this research is requested as part of the FEIS.	At the workshop, it was decided that bottom mapping would be conducted of the potential route of the trunk cable and the inter-node cables on Site A. This work has been initiated.

Name/Agency	Letter Number	Comment Category	Comment Subcategory	Comments	Response
NC Marine Fisheries Commission / Currin, Mac	S-008.3	Fish	Sonar	Disagree with conclusion that there will be no impact to fish populations due to sonar. EIS acknowledges shortcomings on general research, masking, and studies on cumulative impacts of sound. This research needs to be done before the impacts are known.	Effect to individual fish are low/unlikely dependent on species, and therefore significant effects to fish populations are highly unlikely.
Citizens Opposing Active Sonar Threats (COAST) / Wray, Russell	NGO-025.16	Invertebrates	Sonar	DEIS does not discuss mass strandings of giant squid (McKenzie 2004, Guerra et al 2004) nor impacts to snow crab organs (DFO 2004), coincident to seismic surveys.	Sounds produced from seismic surveys are not analogous to those produced by mid-frequency sonar. Using the best and most applicable science, the EIS concludes no impacts to invertebrates through use of MFA. Please refer to Subchapter 3.3.2.
Citizens Opposing Active Sonar Threats (COAST) / Wray, Russell	NGO-025.17	Invertebrates	Sonar	If invertebrates are impacted by sonar use, other levels of food web will be affected.	Using the best and most applicable science, the EIS concludes no significant impacts to invertebrate species from mid-frequency sonar. Please refer to Subchapter 3.3.2.
Natural Resources Defense Council (NRDC)	NGO-026.86	Invertebrates	Sonar	Several sources suggest that invertebrates are vulnerable to acoustic impacts. DEIS conclusion of no impact from sonar is baseless. Single species (lobster) audiogram is not sufficient as representation for all invertebrates.	Using the best and most applicable science, the EIS concludes no significant impacts to invertebrate species from mid-frequency sonar. Please refer to Subchapter 3.3.2.

Name/Agency	Letter Number	Comment Category	Comment Subcategory	Comments	Response
Natural Resources Defense Council (NRDC)	NGO-026.87	Invertebrates	Sonar	Many invertebrate species possess sensors similar to vertebrate ears, impacts of sonar has been seen in giant squid strandings, and damage to brown shrimp and snow crabs.	Using the best and most applicable science, the EIS concludes no significant impacts to invertebrate species from mid-frequency sonar. Please refer to Subchapter 3.3.2.
Booher, Sam	P-040.16	Invertebrates	Sonar	As no data exists, studies are needed on the effects of sonar on blue crab and shrimp before USWTR construction is considered.	Using the best and most applicable science, the EIS concludes no significant impacts to invertebrate species from mid-frequency sonar. Please refer to Subchapter 3.3.2.
Southern Environmental Law Center / Wannamaker, Catherine M.	NGO-017.67	Landside	Sea Turtle Nesting	Navy should not install landside facilities during turtle nesting season to limit impact.	The Navy has consulted with NMFS under ESA; and may consult with USFWS, if needed; on effect to listed species. Please refer to discussion in Chapter 4.
Earthjustice / Renshaw, Katie	NGO-019.3	Landside	Sea Turtle Nesting	Inconsistency between p.4.6-3 and p.6-9 on the impact of installation on sea turtle nests ('temporary' vs. 'negative').	The leatherback has been added into the text in the revised Subchapter 4.6.1.3. This will eliminate any inconsistencies between Subchapters 4.6.1.3 and 6.3. Impacts to turtle nesting will be avoided through the use of horizontal directional drilling of a conduit under the beach and dune habitats.
Citizens Opposing Active Sonar Threats (COAST) / Wray, Russell	NGO-025.86	Landside	Sea Turtle Nesting	Landside installation should not be done during turtle nesting period.	Please refer to revised Subchapters 4.6.1.3 and 6.3. Impacts to turtle nesting will be avoided through the use of horizontal directional drilling of a conduit under the beach and dune habitats.

Name/Agency	Letter Number	Comment Category	Comment Subcategory	Comments	Response
Natural Resources Defense Council (NRDC)	NGO-026.130	Landside	Sea Turtle Nesting	Landside installation should not be done during turtle nesting period.	Please refer to revised Subchapters 4.6.1.3 and 6.3. Impacts to turtle nesting will be avoided through the use of horizontal directional drilling of a conduit under the beach and dune habitats.
Natural Resources Defense Council (NRDC)	NGO-026.131	Landside	Sea Turtle Nesting	Known sea turtle nesting areas may not be static. Other mitigation may be necessary.	Please refer to revised Subchapters 4.6.1.3 and 6.3. Impacts to turtle nesting will be avoided through the use of horizontal directional drilling of a conduit under the beach and dune habitats.
Natural Resources Defense Council (NRDC)	NGO-026.132	Landside	Shorebird	Piping plover mitigation is inadequate, as it is a vague post-selection measure.	Please refer to revised Subchapter 6.3. Impacts to piping plover nests will be avoided through conducting a pre-construction survey and avoiding areas where piping plover nesting activity is observed. In addition, the use of horizontal directional drilling of a conduit under the beach and dune habitats would avoid direct impacts to piping plover nests.
VA Dept of Game and Inland Fisheries (VDGIF) / Ewing, Amy	S-015.2	Landside	Shorebird	Piping plovers have been increasing in population, resulting in nests in previously uninhabited areas.	Please refer to revised Subchapter 6.3. Impacts to piping plover nests will be avoided through conducting a pre-construction survey and avoiding areas where piping plover nesting activity is observed. In addition, the use of horizontal directional drilling of a conduit under the beach and dune habitats would avoid direct impacts to piping plover nests.

Name/Agency	Letter Number	Comment Category	Comment Subcategory	Comments	Response
VADEQ / Hollis, Michelle. R.	S-013.1	Landside	Wetland	Any excavation, dredging or fill associated with installation within surface waters will require authorization from VADEQ.	Comment noted. If Alternative D is selected, the Navy will acquire all required permits.
City of Jacksonville Artificial Reef Coordinator / Morton, Robert	L-003.1	Marine Habitat	Artificial Reefs	Potential conflicts of USWTR with artificial reefs (deployment and present use) have not been addressed. Request consultation of potential conflicts.	Detailed maps of landfall installation will be prepared after the Record of Decision (ROD) has been approved. If any permits are required, they will be obtained prior to construction. Impacts related to resources are discussed in Chapter 4.6.
Jacksonville Offshore Fishing Club / Kalakauskis, Ed	NGO-022.1	Marine Habitat	Artificial Reefs	USWTR would conflict with future planned artificial reef projects in the Jacksonville range area.	All authorized future reef locations are in-shore of the proposed USWTR range. Therefore, the proposed USWTR would have no impact on the number or cost of artificial reefs. The Navy has obtained, from the City of Jacksonville, locations of all existing and permitted artificial reefs. The location of authorized artificial reefs are shown on Figure 3.5-1, and will be considered in the design of the location of the route of the trunk cable. However, any future artificial reefs proposed within the range or in the vicinity of the trunk cable would conflict with range instrumentation.

Name/Agency	Letter Number	Comment Category	Comment Subcategory	Comments	Response
Kauskis, Ed	P-063.1	Marine Habitat	Artificial Reefs	Jacksonville alternative would take areas for establishment of potential artificial reefs. Artificial reefs are beneficial for the local economy.	All authorized future reef locations are in-shore of the proposed USWTR range. Therefore, the proposed USWTR would have no impact on the number or cost of artificial reefs. The Navy has obtained, from the City of Jacksonville, locations of all existing and permitted artificial reefs. The location of authorized artificial reefs are shown on Figure 3.5-1, and will be considered in the design of the location of the route of the trunk cable. However, any future artificial reefs proposed within the range or in the vicinity of the trunk cable would conflict with range instrumentation.
Kauskis, Ed	P-063.4	Marine Habitat	Artificial Reefs	USWTR would cause artificial reefs to be made further from Jacksonville, which would increase costs, which would likely mean fewer reefs established.	All authorized future reef locations are in-shore of the proposed USWTR. Therefore, the proposed USWTR would have no impact on the number or cost of artificial reefs.

Name/Agency	Letter Number	Comment Category	Comment Subcategory	Comments	Response
FL Fish and Wildlife Conservation Commission (FFWCC) / Poole, Mary Ann	S-021.21	Marine Habitat	Artificial Reefs	Concern #1: Fact Sheet No. Seven on the project website (http://projects.earthtech.com/USWTR/Public_Involvement/Public_Involvement_2008/PDF_fact_sheets_2008/FS7_Effects-on-Fishing-2008.pdf) illustrates the approximate locations of some of the existing artificial reef and natural areas in the vicinity of Site A, but the trunk cable location is not shown, and the illustration is not at a scale with enough detail to identify the artificial reef areas that may be effected by the proposed project. Recommendation #1: Please include figures within the EIS at appropriate scales to illustrate the location of the proposed trunk cable, the locations of the existing artificial reef permitted areas, and the existing artificial reef materials within 500 feet of the proposed trunk cable.	The trunk cable route will be planned to minimize impacts and will be addressed as part of the U.S. Army Corps of Engineers permit review. Locations of existing and permitted artificial reefs in the Jacksonville OPAREA are shown on the revised Figure 3.5-1. Information obtained as a result of the bottom mapping surveys previously mentioned will assist the Navy in engineering the cable path to avoid artificial reefs, hardbottom, shipwrecks, and other obstructions to the maximum extent practicable.

Name/Agency	Letter Number	Comment Category	Comment Subcategory	Comments	Response
FL Fish and Wildlife Conservation Commission (FFWCC) / Poole, Mary Ann	S-021.22	Marine Habitat	Artificial Reefs	Concern #2: There are 25 past and present permitted artificial reef areas located offshore in Jacksonville in the Atlantic Ocean between approximately 7 and 30 nautical miles from the St. Johns River Entrance Channel (Figure 1). Most of the sites are roughly rectangular in shape, with an average area of 2.4 square miles each. We are concerned that the proposed trunk cable placement may cross some of these sites, preventing future development of some of the existing artificial reef areas. Recommendation #2: Please include in the EIS a description of the proposed route of the trunk cable, and how the existing charted artificial reef areas will be avoided.	The trunk cable route will be planned to minimize impacts and will be addressed as part of the U.S. Army Corps of Engineers permit review. Locations of existing and permitted artificial reefs in the Jacksonville OPAREA are shown on the revised Figure 3.5-1. Information obtained as a result of the bottom mapping surveys previously mentioned will assist the Navy in engineering the cable path to avoid artificial reefs, hardbottom, shipwrecks, and other obstructions to the maximum extent practicable.

Name/Agency	Letter Number	Comment Category	Comment Subcategory	Comments	Response
FL Fish and Wildlife Conservation Commission (FFWCC) / Poole, Mary Ann	S-021.23	Marine Habitat	Artificial Reefs	Concern #3: In addition to the 25 existing artificial reef permitted areas which are illustrated on NOAA nautical chart #11488, there are some charted artificial reef materials and shipwrecks identified outside of the artificial reef 'Fish Haven' areas, charted as 'obstructions.' We are concerned that some of those sites may be impacted be the trunk cable placement. Recommendation #3: Please include in the EIS a description of the proposed route of the trunk cable, and how the existing artificial reef and shipwreck materials located outside the charted 'Fish Haven' areas will be avoided.	Fish havens will be evaluated and added if significantly different than the artificial reefs and live/hard bottom areas already included. The Navy is conducting ongoing hydrographic and bottom mapping surveys at the Jacksonville site. These data will be used to identify and avoid, to the extent possible, critical fish habitat areas, although the results of these surveys will not be available prior to the release of the FEIS.

Name/Agency	Letter Number	Comment Category	Comment Subcategory	Comments	Response
FL Fish and Wildlife Conservation Commission (FFWCC) / Poole, Mary Ann	S-021.25	Marine Habitat	Artificial Reefs	Concern #5: To date, the deepest artificial reef site off of Jacksonville has maximum depth of -110 feet MLLW. The City of Jacksonville is interested in acquiring a large military ship in the future for artificial reefing, but none of the existing artificial reef site depths are deep enough to accommodate a large military ship artificial reef...Unfortunately, the location of the proposed USWTR encompasses the areas that the City of Jacksonville has been considering for a future deepwater artificial reef site. While the DEIS mentions that anchoring and trawling may be prohibited within the boundaries of the proposed USWTR, DEIS does not specifically state whether or not future artificial reef development would be prohibited...Recom. #5: Please include in the EIS discussion on the possibility of permitting a future artificial reef permitted area within the boundaries of the USWTR, measuring 0.25 nm on a side, around the 150-170 ft depth contour.	The Navy has contacted the City of Jacksonville about plans for future artificial reefs and have not found that any future reefs exist within the USWTR site (see revised Figure 3.5-1). Placement of artificial reefs within the USWTR range after installation would interfere with range equipment.

Name/Agency	Letter Number	Comment Category	Comment Subcategory	Comments	Response
FL Fish and Wildlife Conservation Commission (FFWCC) / Poole, Mary Ann	S-021.32	Marine Habitat	Artificial Reefs	Concern #12: Section 6.4 of the DEIS does not state whether any mitigation measures are planned for impacts to hard bottom resources. Recommendation #12: The EIS should include a discussion of the Navy's intentions for how impacts to hard bottom resources will be offset in the event that loss of hard bottom habitat occurs during trenching and placement of offshore cables. While the preferred option is avoidance of impacts, where appropriate, construction of artificial reefs (boulder reefs, concrete modules, etc.) have been successfully constructed as mitigation for similar projects that have impacted offshore hard bottom resources.	The Navy is currently undertaking Essential Fish Habitat (EFH) consultation with the Southeast Regional Office of the National Marine Fisheries Service. The document will be modified to address any changes the come as a result of that consultation prior to the publication of the FEIS. If additional concerns are voiced by NMFS after the publication of the FEIS, those concerns will be addressed in the Navy's Record of Decision (ROD).
Southern Environmental Law Center / Wannamaker, Catherine M.	NGO-017.35	Marine Habitat	Benthic Habitat	Belief that no permanent loss of bottom habitat because of temporary disturbance is unsupported.	The Navy consulted with NMFS regarding impacts to EFH. The required mitigation measures will be implemented. Please refer to the revised Chapter 6. Bottom mapping of the trunk cable is being done to plan a route of installation that will minimize impact to benthic habitat.

Name/Agency	Letter Number	Comment Category	Comment Subcategory	Comments	Response
Southern Environmental Law Center / Wannamaker, Catherine M.	NGO-017.40	Marine Habitat	Benthic Habitat	DEIS does not fully asses the impacts to larger ecosystem from cable installation or offer mitigation to compensate for loss of habitat.	The Navy consulted with NMFS regarding impacts to EFH. The required mitigation measures will be implemented. Please refer to the revised Chapter 6. Bottom mapping of the trunk cable is being done to plan a route of installation that will minimize impact to benthic habitat.
Kauskis, Ed	P-063.2	Marine Habitat	Benthic Habitat	Jacksonville alternative trunk cable may go across natural bottom or artificial reef bottom. FL has few outcroppings of live bottom.	The Navy is conducting bottom mapping surveys at the Jacksonville site. Data will be used to characterize potential biological habitats and hard bottom to avoid impacting those areas, if possible, during installation.
North Carolina Wildlife Resources Commission (NCWRC) / Dunn, Maria T.	S-005.7	Marine Habitat	Benthic Habitat	Concern of USWTR impact on hard bottom and fisheries - support recommendations made by NCDMF	See responses to the received comment letter from NCDMF (S-006).
North Carolina Division of Marine Fisheries (NCDMF) / Duval, Michelle	S-006.4	Marine Habitat	Benthic Habitat	DEIS does not include mitigation for impacts to benthic habitats, include these in Chapter 6.	The Navy is conducting bottom mapping surveys at the Jacksonville site. Data can be used to characterize potential biological habitats and hard bottom. The Navy is consulting with NMFS regarding the anticipated impacts to benthic habitat and the requirements for mitigation.

Name/Agency	Letter Number	Comment Category	Comment Subcategory	Comments	Response
NC Marine Fisheries Commission / Currin, Mac	S-008.4	Marine Habitat	Benthic Habitat	DEIS does not include mitigation for impacts to benthic habitats. Mitigation, including benthic surveys of unmapped areas, is required.	The Navy is conducting bottom mapping surveys at the Jacksonville site. Data can be used to characterize potential biological habitats and hard bottom. The Navy is consulting with NMFS regarding the anticipated impacts to benthic habitat and the requirements for mitigation.

Name/Agency	Letter Number	Comment Category	Comment Subcategory	Comments	Response
FL Department of Environmental Protection (FLDEP) / Griffin, Lynn	S-020.1	Marine Habitat	Benthic Habitat	The DEIS presents a project concept and general maps, but should provide diagrams or maps of cable routes and sonar nodes in relation to benthic resources, artificial reefs, fisheries habitat, etc. More information on installation methodologies is required. For example, the cable burial vehicle is described as having a width of 16 ft., but the DEIS does not clarify whether that equates to a 16-ft. impact swath along the entire estimated 600 nautical miles of cable to be installed. In addition, there are no maps showing precisely where the trunk cable would come on shore. Although the trunk cable is only 2.5 inches in diameter, the DEIS mentions that it will be installed via directional drilling, but does not provide details on the extent of disturbance related to its installation.	The text for Chapter 2 of the FEIS has been revised and can help address this comment.

Name/Agency	Letter Number	Comment Category	Comment Subcategory	Comments	Response
FL Department of Environmental Protection (FLDEP) / Griffin, Lynn	S-020.2	Marine Habitat	Benthic Habitat	The DEIS should include detailed maps depicting the locations of benthic resources in relation to proposed structures and cables. Benthic resource information should be obtained from biological and photographic surveys using protocols sufficient to allow the types and areal extent of affected resources and ecosystems, especially those that may be unique to the area, to be quantified and mapped.	Revised text from Chapter 2 of the FEIS states: The risk of harming benthic organisms during the installation of the cable and nodes would be minimized by thoroughly surveying the area prior to the burial process. The survey would use multi-beam sonar to collect information such as bathymetry, seabed morphology at scales of 1.6 to 33 feet (0.5 to 10 meters), sediment types, and surface geology. This information would be coupled with photographs of the ocean bottom and biological/geological samples to provide accurate data on the location of existing habitats.

Name/Agency	Letter Number	Comment Category	Comment Subcategory	Comments	Response
FL Department of Environmental Protection (FLDEP) / Griffin, Lynn	S-020.3	Marine Habitat	Benthic Habitat	The DEIS should examine and quantify all permanent, temporary and secondary impacts to habitats, especially the acreage of live and hardbottom to be eliminated or disturbed by installation of the cable grid and the long term effects of USWTR training activities. The DEIS should describe how these impacts will be avoided or minimized. Resource impact evaluations and project alternatives should be based on complete descriptions of all aspects of the proposed activities, including alignment and construction options.	The text for Chapter 2 of the FEIS has been revised and can help address this comment.

Name/Agency	Letter Number	Comment Category	Comment Subcategory	Comments	Response
FL Department of Environmental Protection (FLDEP) / Griffin, Lynn (General)	S-020.14	Marine Habitat	Benthic Habitat	Please provide a more detailed description including diagrams of the remotely operated cable burial vehicle. Please provide a more detailed description of the anticipated impacts to benthic habitats due to using the cable burial vehicle. Since the burial vehicle is approximately 16 ft in width, how will impacts to possible sensitive benthic habitat be avoided during construction of the proposed project? Please discuss if there are any other alternative construction methods to the cable burial vehicle.	The text for Chapter 2 and Subchapter 4.2.3.1 of the FEIS has been revised and can help address this comment. At this time, Navy engineers have not decided on the exact type of cable laying vehicle to be used for the construction of the USWTR, so a diagram is not able to be provided. After the completion of the bottom mapping of the range site, more definitive engineering decisions will be reached and a cable laying vehicle will be chosen.
FL Department of Environmental Protection (FLDEP) / Griffin, Lynn (General)	S-020.15	Marine Habitat	Benthic Habitat	The information presented represents only about 20% of the proposed site A. In meetings with the DoN, it was relayed to the state that surveys of the area were being planned. The methodology, data, and analysis from those surveys should be included in the Final EIS. Along with the sonar range, the entire run of the trunk cable should also be surveyed and analyzed.	The Navy performed data collection for the benthic studies of the trunk cable corridor in December of 2008. The results of the survey will not be available to the Navy until June of 2009, after the publication of the Final EIS. The survey of the range area itself is not slated to begin until mid to late 2009, so it likely that the results of that survey will not be available until calendar year 2010. We will share the survey data with Florida DEP once the final report is ready.

Name/Agency	Letter Number	Comment Category	Comment Subcategory	Comments	Response
FL Department of Environmental Protection (FLDEP) / Griffin, Lynn (General)	S-020.18	Marine Habitat	Benthic Habitat	Bottom habitats in the entire range and corridor at Site A should be surveyed and analyzed for habitat types. Information collected should be forwarded to the state for review and should include maps and figures showing the designated habitats overlaid with the proposed project alignment (cable placement, sonar node placement, and impacts expected from construction and usage).	The Navy performed data collection for the benthic studies of the trunk cable corridor in December of 2008. The results of the survey will not be available to the Navy until June of 2009, after the publication of the Final EIS. The survey of the range area itself is not slated to begin until mid to late 2009, so it likely that the results of that survey will not be available until calendar year 2010. We will share the results of the survey with Florida DEP once the final report is ready.
FL Department of Environmental Protection (FLDEP) / Griffin, Lynn (General)	S-020.21	Marine Habitat	Benthic Habitat	If the ocean bottom burial equipment cannot cut the hard bottom, what other alternative methods of installation will be used?	The text for Chapter 2 of the FEIS has been revised and can help address this comment.

Name/Agency	Letter Number	Comment Category	Comment Subcategory	Comments	Response
FL Department of Environmental Protection (FLDEP) / Griffin, Lynn (General)	S-020.31	Marine Habitat	Benthic Habitat	Are seagrasses expected in the nearshore area of the proposed project? If so, will surveys be done to determine the extent of the resource? Describe how impacts will be avoided.	All available seagrass mapping information indicates that no seagrass is present at the trunk cable site. If it is later discovered that seagrass beds are present within the proposed trunk cable route, all efforts would be made to avoid the beds by installation of the trunk cable in conduit from the shore by directional drilling. Directional drilling would begin on land and tunnel for a distance of 2,000 to 4,000 ft. If the conduit's termination point (i.e., location where the conduit exits the sea floor) cannot be positioned to avoid a sea grass bed, the impacts to the bed would be minimal. It is anticipated that the termination point impact area would be less than 10 square feet.
FL Department of Environmental Protection (FLDEP) / Griffin, Lynn (General)	S-020.34	Marine Habitat	Benthic Habitat	Artificial hard substrate does not replace the value or function of a natural hardbottom.	Comment noted.

Name/Agency	Letter Number	Comment Category	Comment Subcategory	Comments	Response
FL Department of Environmental Protection (FLDEP) / Griffin, Lynn (General)	S-020.35	Marine Habitat	Benthic Habitat	Please discuss if expendable materials such as wires could potentially physically impact benthic resources found within the biogenic reef community including deepwater corals. Is there a potential for the wires to wrong around organisms/benthic habitat and cause abrasion damage?	The EIS analysis (within Subchapters 4.1 and 4.2) determined that no significant impact from expended materials will occur. The best available science is used to assess impact of expended materials on the marine environment.
FL Department of Environmental Protection (FLDEP) / Griffin, Lynn (General)	S-020.36	Marine Habitat	Benthic Habitat	The DEIS should include a discussion of the impact parachutes that are considered expendable and will not be recovered on benthic resources. Please discuss the impact these parachutes will have on benthic resources (smothering, entangling, etc.). What sizes are the parachutes that will be used in the project area? How long are these parachutes expected to be present before degrading? Could these parachutes be constructed of biodegradable material, so as to minimize possible impacts?	Impacts to turtles in association with parachutes are highly unlikely due to the relatively large geographic area involved coupled with the relatively small number of sonobuoys used in each of the exercises. The best available science is used to assess impact of expended materials on the marine environment.

Name/Agency	Letter Number	Comment Category	Comment Subcategory	Comments	Response
FL Department of Environmental Protection (FLDEP) / Griffin, Lynn (General)	S-020.38	Marine Habitat	Benthic Habitat	How long will the control wires from the Mk 48 EXTORP? What is the entanglement possibility for EFH and corals from the control wires?	Please refer to Subchapter 4.2.4.2. Due to the stiffness of torpedo control wires and flex hoses, these expended materials would not tend to form loops and entangle EFH and corals.
FL Department of Environmental Protection (FLDEP) / Griffin, Lynn (General)	S-020.39	Marine Habitat	Benthic Habitat	Please discuss if expendable flex hoses could pose either an entanglement issue or a continuous impact problem for EFH and/or corals present in the proposed project area.	Please refer to Subchapter 4.2.4.2. Due to the stiffness of torpedo control wires and flex hoses, these expended materials would not tend to form loops and entangle EFH and corals.
FL Department of Environmental Protection (FLDEP) / Griffin, Lynn (General)	S-020.22	Marine Habitat	Coral Outcrops	What type of turbidity plumes are expected with the use of the bottom burial equipment? How long will the plumes last, what resources could be affected from the burial equipment?	Please refer to the revised text in Chapter 2. In addition, revised text in Subchapter 4.1.1.1 states "Expected turbidity plumes typically would last for a few hours and occur in the area near the ocean bottom. Without currents, the effects would be confined to the immediate vicinity of the cable, i.e. within about 10 m (33 ft) from the trench. Water currents would distribute the plume over a larger area but also dilute it..."

Name/Agency	Letter Number	Comment Category	Comment Subcategory	Comments	Response
FL Fish and Wildlife Conservation Commission (FFWCC) / Poole, Mary Ann	S-021.29	Marine Habitat	Benthic Habitat	Concern #9: While the SEAMAP mapping data provides a broad overview of the benthic habitat distribution in each region, the SEAMAP data does not provide 100% coverage of the entire proposed USWTR. The DEIS does not state whether or not the Navy intends to conduct a more detailed mapping of the seafloor prior to trenching and/or cable placement to avoid impacts to existing hardbottom resources and artificial reefs. Recommendation #9: Please provide more detailed mapping within the specific cable placement areas once those areas are chosen. Describe the methods that will be used to map, classify, and report the findings within each survey area.	Hard bottom data from the South Atlantic Fishery Management Council's Habitat and Ecosystem Interactive Map have been added to the mapping of hardbottom in the EIS. In addition, the Navy in undertaking ongoing efforts to conduct hydrographic and bottom mapping surveys of the Jacksonville site and trunk cable corridor. The data obtained from these surveys will be used to identify and avoid, to the extent possible, artificial reefs and critical fish habitat areas. Furthermore, the Navy is in consultation with NMFS regarding impacts to EFH. The surveys and their corresponding reports, however, will not be complete prior to the release of the FEIS.

Name/Agency	Letter Number	Comment Category	Comment Subcategory	Comments	Response
FL Department of Environmental Protection (FLDEP) / Griffin, Lynn (General)	S-020.23	Marine Habitat	Coral Outcrops	Should surveys reveal deepwater corals present in the area of the proposed project, please describe what procedures that will be used to avoid and minimize impact to these resources. Deep water corals and livebottom habitats are a valuable resource providing habitats including EFH that are slow to recover from impacts.	Please refer to Subchapter 4.2.3.1. During installation, transducer nodes would be placed to avoid hard bottom substrate to the maximum extent practical. The Navy is conducting bottom mapping surveys at Site A in 2009. Data from these surveys would be used to characterize potential biological habitats and hard bottom, and minimize impacts to these habitats.
FL Department of Environmental Protection (FLDEP) / Griffin, Lynn (General)	S-020.24	Marine Habitat	Coral Outcrops	Deepwater corals tend grow very slowly and inhabit areas with specific requirements. Please provide references supporting the idea deepwater corals would recolonize the disturbed area created by the construction of the sonar range.	Revised text in Subchapter 4.1.1.1 states "Growth rates of branching deepwater coral species, such as *Lophelia* and *Oculina*, are relatively low, ranging from about 10. to 2.5 cm/yr (0.4 to 1 in/yr)." (This information was obtained from NOAA, NOAA Coral Reef Information System - Deepwater Corals. http://www.coris.noaa.gov/about/deep/). The Navy recognizes that the installation of the USWTR may adversely affect biogenic reef community (see Subchapter 4.2.3.1) and is currently undertaking Essential Fish Habitat (EFH) consultation with the Southeast Regional Office of the National Marine Fisheries Service.

Name/Agency	Letter Number	Comment Category	Comment Subcategory	Comments	Response
Earthjustice / Renshaw, Katie	NGO-019.5	Marine Habitat	Essential Fish Habitat	Cutting cable furrow goes through 9 EFH areas, and could cause ecological impact. Navy does not explain impacts or discuss mitigation methods.	The Navy is conducting hydrographic and bottom mapping surveys at the Jacksonville site. These data will be used to identify and avoid, to the extent possible, critical fish habitat areas. Furthermore, the Navy is in consultation with NMFS regarding impacts to EFH.
Jacksonville Offshore Fishing Club / Kalakauskis, Ed	NGO-022.2	Marine Habitat	Essential Fish Habitat	Jacksonville alternative could harm the marine ecosystem, impacting Elton Bottom, a prolific pelagic and bottom fishing area.	The Navy is conducting hydrographic and bottom mapping surveys at the Site A range and trunk cable corridor. These data will be used to identify and avoid, to the extent possible, critical fish habitat areas including Elton Bottom. The Navy does not anticipate fish populations or fisheries being significantly affected by the range installation or training activities. In addition, fishing will not be restricted by USWTR training. The Navy is in consultation with NMFS regarding impacts to EFH.

Name/Agency	Letter Number	Comment Category	Comment Subcategory	Comments	Response
FL Fish and Wildlife Conservation Commission (FFWCC) / Poole, Mary Ann	S-021.20	Marine Habitat	Essential Fish Habitat	The seabed within the proposed USWTR area and the trunk cable from the USWTR to the cable termination facility contains some habitats that are classified as essential fish habitat (EFH) pursuant to South Atlantic Fishery Management Council regulations, including live/hardbottom habitat, existing artificial/manmade artificial reef materials, and locations proposed for future artificial reef materials. Placement of cables within the proposed USWTR may impact existing live/hardbottom habitat, existing artificial/manmade artificial reef materials, and the placement of proposed for future artificial reef materials.	The Navy is undertaking ongoing efforts to conduct hydrographic and bottom mapping surveys of the Jacksonville site and trunk cable corridor. The data obtained from these surveys will be used to identify and avoid, to the extent possible, artificial reefs and critical fish habitat areas. Furthermore, the Navy is in consultation with NMFS regarding impacts to EFH. The surveys and their corresponding reports, however, will not be complete prior to the release of the FEIS.
Southern Environmental Law Center / Wannamaker, Catherine M.	NGO-017.71	Marine Habitat	Hard Bottom Habitat	Navy should map the relevant sea floor, and identify hard bottom and coral, and monitor impacts to these areas.	The Navy is conducting hydrographic and bottom mapping surveys at the Jacksonville site and the trunk cable corridor. There is no plan for formal benthic habitat monitoring.

Name/Agency	Letter Number	Comment Category	Comment Subcategory	Comments	Response
FL Department of Environmental Protection (FLDEP) / Griffin, Lynn (General)	S-020.20	Marine Habitat	Hard Bottom Habitat	The third paragraph states that hard bottom ledges and biogenic reef mounds are unlikely to be impacted because of difficulty of using burial equipment in areas where those resources occur. Will these areas be avoided when laying the grid? If so, please explain how these areas will be avoided. If avoidance is not possible, please describe how impacts will be minimized. If the transmission cable cannot be buried, how will it be secured to the substrate to ensure no movement will occur?	Data from the 2009 bathymetric survey will identify bottom ledges and biogenic reefs to be avoided to the maximum extent possible. Please refer to Subchapter 4.1.1.1: if transducer nodes or trenched cables were to be installed in biogenic reefs, permanent localized damage may occur. Subchapter 4.2.3.1: During installation, transducer nodes and cables would be placed to avoid hard bottom substrate to the maximum extent practical. Due to installation constraints, only small habitat areas and features can be avoided. The Navy is consulting with NMFS as to the impact on benthic resources, including biogenic reefs, and will implement any required mitigation measures. See Subchapter 2.2.1 for information on the placement of cable on bottom ledges. The cable will not be secured, but with 3-5% of slack, and the weight of the cable, it is not expected to be affected by the current.

Name/Agency	Letter Number	Comment Category	Comment Subcategory	Comments	Response
FL Fish and Wildlife Conservation Commission (FFWCC) / Poole, Mary Ann	S-021.26	Marine Habitat	Hard Bottom Habitat	Concern #6: The last paragraph on page 3.2-20 states 'Within Site A, hard bottom areas comprise about 97% of the surveyed area in the range (1,026 km^2 [299 NM^2]) and 97% of the surveyed area in the corridor (1,540 km^2 [449 NM^2]).' However, figure 3.2-3 clearly does not illustrate that 97% of the surveyed area is hardbottom. Recommendation #6: Please review and correct the '97%' percent hard bottom coverage references in the last paragraph of page 3.2-20.	Please refer to the revised text in Subchapter 3.2.4.1 and the EFH Assessment regarding impacts to hard bottom. These figures have been revised.
NY Whale and Dolphin Action League / Williams, Taffy	NGO-018.2	Marine Habitat	Marine Life	DEIS should be withdrawn as it is deficient in risk analysis of fish, sea turtles, birds, and others.	The EIS used the best available and most applicable science with regard to analysis of predictable impacts to fish, sea turtles, birds, and other animals that may be found in the USWTR range.

Name/Agency	Letter Number	Comment Category	Comment Subcategory	Comments	Response
Natural Resources Defense Council (NRDC)	NGO-026.14	Marine Habitat	Marine Life	Noise can kill, disable or disrupt the behavior of invertebrates.	Please refer to Subchapter 3.3.2.6: USWTR active sonar is not considered to be in the primary hearing [detection] register of those invertebrate species that may possess the ability to sense sound and the potential for effects is negligible for invertebrate species that may inhabit the area during USWTR operations. Although some invertebrates may be sensitive to noise, the frequencies of USWTR sonar sources are not considered to impact them.
Capozzelli, J.	P-016.1	Marine Habitat	Marine Life	Request that the Navy not harm whales or other marine life with the use of high intensity mid-frequency sonar.	Comment noted. No mortalities are expected due to sonar use (see Chapter 4). The Navy is implementing a marine mammal mitigation and monitoring program (see Subchapters 6.1 and 6.2) to minimize potential impacts to whales and other marine life.
Thomas, Dennis	P-023.1	Marine Habitat	Marine Life	Scientific studies are needed to assess the impact of USWTR to sea life, including whales.	The Navy supports a number of research efforts that are investigating potential effects of sonar on marine mammals. The EIS summarizes our current knowledge on the effects of sonar on marine life, which includes many studies conducted by the Navy. During 2004-2008, DoN provided over $94 million to support marine research, and has budgeted $22 million for 2009. This research will improve detection and monitoring of marine species, and further evaluate the effect of sound on marine life.

Name/Agency	Letter Number	Comment Category	Comment Subcategory	Comments	Response
Booher, Sam	P-040.13	Marine Habitat	Marine Life	GA has compiled marine data to show a much more productive and diverse marine environment than the Navy portrays.	This statement is has no supporting reference or data. Please refer to the revised Subchapter 3.4 for additional GA fisheries data.
Browning, Jan	P-041.1	Marine Habitat	Marine Life	Installation and use of USWTR will jeopardize much more than analyzed in DEIS.	The EIS used the best available and most applicable science, and evaluated potential impacts of the USWTR on marine life, and mitigation measures (Chapter 6) are proposed for resources that may be disturbed.
Browning, Jan	P-041.2	Marine Habitat	Marine Life	Marine life habitat already in peril, and USWTR can only negatively impact the habitat.	Please refer to Subchapter 4.8 for cumulative impact analysis of all anthropogenic activity in the USWTR study area. Further, refer to Chapter 6 for mitigation measures aimed at minimizing impacts of USWTR.

Name/Agency	Letter Number	Comment Category	Comment Subcategory	Comments	Response
Bonhom, Sandra	P-071.1	Marine Habitat	Marine Life	Concern for effects of USWTR on marine life.	The Navy follows federal and military guidance for the protection of threatened and endangered species and sensitive habitats. Mitigation measures outlined in Chapter 6 of the EIS were prepared to minimize impacts to these species and habitats. The Navy supports a number of research efforts that are investigating potential effects of sonar on marine mammals. During 2004-2008, DoN provided over $94 million to support marine research, and has budgeted $22 million for 2009. This research will improve detection and monitoring of marine species, and further evaluate the effect of sound on marine life.
Davis, Susan	P-076.1	Marine Habitat	Marine Life	DEIS does not acknowledge risks to marine life, including right whale.	Potential risks to marine life are covered extensively in the EIS. Potential risks to right whales are discussed in Subchapters 4.2, 4.3, and 4.8. Specific mitigation measures for the protection of the right whale are included in Subchapter 6.2 (in addition to marine mammal mitigation in 6.1).
McCormick, Maggie	P-079.1	Marine Habitat	Marine Life	DEIS does not acknowledge risks to marine life, including right whale.	Potential risks to marine life are covered extensively in the EIS. Potential risks to right whales are discussed in Subchapters 4.2, 4.3, and 4.8. Specific mitigation measures for the protection of the right whale are included in Subchapter 6.2 (in addition to marine mammal mitigation in 6.1).

Name/Agency	Letter Number	Comment Category	Comment Subcategory	Comments	Response
Serfass, Linda	P-081.1	Marine Habitat	Marine Life	Concerns of completeness of DEIS on environmental and acoustic impacts.	The Navy performed an extensive analysis on potential acoustic impacts from operation of the USWTR (including MFA sonar use), using the best available science. This is presented in Subchapter 4.3 of the EIS, which spans almost 150 pages and references many reputable resources. Concerns regarding marine mammals, raised by the commenter, are covered in detail in this section. Environmental concerns are discussed in detail throughout the EIS.
Serfass, Linda	P-081.2	Marine Habitat	Marine Life	Stress of disrupted feeding and migration due to USWTR add to already present stresses and may lead to reduction in marine animal populations.	The EIS used the best available and most applicable science, and evaluated potential impacts of the USWTR on marine life, and mitigation measures (Chapter 6) are proposed for species that may be disturbed. Please refer to Subchapter 4.3.1.3.3 for a discussion of stress effects.
Alsentzer, Dorothée A.	P-083.1	Marine Habitat	Marine Life	DEIS present impacts as unquantified, with particular concern for hard bottom habitat, fish, turtle and cumulative impacts.	Impacts to hard bottom habitat, finfish, and sea turtles are discussed in Subchapters 4.2.2 to 4.2.4 and cumulative impacts are discussed in Subchapter 4.8. In instances where the calculation of impacts was not possible and/or the uncertainty introduced would have led to questionable results, a qualitative impact evaluation was performed using the best available information.

Name/Agency	Letter Number	Comment Category	Comment Subcategory	Comments	Response
Alsentzer, Dorothée A.	P-083.2	Marine Habitat	Marine Life	NEPA requires that the Navy undertake a study to more fully evaluate effects on habitat and marine life.	The EIS fulfils NEPA requirements, as described in Subchapter 1.5. EIS represents the best available and most applicable science with regard to effects of USWTR on marine life. Navy continues to fund research on distribution and effects of sound on marine life.
Natural Resources Defense Council (NRDC)	NGO-026.108	Marine Habitat	Marine Protected Areas	USWTR should avoid federal and state marine protected areas.	USWTR requires certain physiographic features for effective training. The Site A trunk cable would cross the North Atlantic right whale critical habitat to connect range instrumentation to the cable termination facility located at Naval Station Mayport. Installation of the trunk cable would take place outside of right whale calving season (please refer to Subchapter 6.4). The Navy is consulting with NMFS regarding actions that could be taken to avoid or minimize potential impacts of the construction or operation of the USWTR on the recently established snapper grouper MPAs.
Beasley, Jean	P-027.2	Marine Habitat	Marine Protected Areas	There is an associated area dedicated by the state [NC?] as sea turtle sanctuary that has been largely ignored.	The Onslow Bay Sea Turtle Sanctuary is discussed on Page 3.2-48 and shown in Figure 3.2-7. Beach habitat used for nesting will not be disturbed due to horizontal directional drilling of a conduit under the beach. The Navy is consulting with NMFS on mitigation of potential impacts to sea turtles.

Name/Agency	Letter Number	Comment Category	Comment Subcategory	Comments	Response
FL Department of Environmental Protection (FLDEP) / Griffin, Lynn (General)	S-020.17	Marine Habitat	Marine Protected Areas	The state recommends adjusting the boundaries of the proposed range, so the recently designated MPA would not be within the proposed range.	Please refer to Subchapter 4.2.3.1 of the FEIS. The Navy has initiated EFH consultation with the NMFS, which will include discussions regarding actions that could be taken to avoid or minimize potential impacts of the construction or operation of the USWTR on the MPA.
FL Department of Environmental Protection (FLDEP) / Griffin, Lynn (General)	S-020.33	Marine Habitat	Marine Protected Areas	The state recommends shifting the boundaries of the proposed project so that the North Florida MPA would not be within the proposed project site A.	Please refer to Subchapter 4.2.3.1 of the FEIS. The Navy has initiated EFH consultation with the NMFS, which will include discussions regarding actions that could be taken to avoid or minimize potential impacts of the construction or operation of the USWTR on the MPA.

Name/Agency	Letter Number	Comment Category	Comment Subcategory	Comments	Response
FL Fish and Wildlife Conservation Commission (FFWCC) / Poole, Mary Ann	S-021.28	Marine Habitat	Marine Protected Areas	Concern #8: The DEIS references the deepwater Marine Protected Area (MPA) off North Florida that is intended to protect the habitat and stocks of deepwater overexploited fishes of the grouper-snapper complex…This is to be a Type II MPA - no anchoring or bottom fishing, no use of shark bottom longlines...The area is intended to protect species and habitat of snowy, yellowedge, and misty grouper, speckled hind and blueline tilefish all of which are longlived and experiencing overfishing. Since the USWTR encompasses the North Florida MPA in its entirety, we presume that the USWTR was intentionally sited to encompass the North Florida MPA because of the existing MPA fishing gear restrictions. The DEIS does not specifically state what sort of bottom modifications will be created by the cable within the MPA. Recommendation #8: Please provide additional description of the location of the	The text for Chapter 2 of the FEIS has been revised and can help address this comment. See subchapter 4.2.3 of the FEIS for a description of construction impacts.

Name/Agency	Letter Number	Comment Category	Comment Subcategory	Comments	Response
FL Fish and Wildlife Conservation Commission (FFWCC) / Poole, Mary Ann (cont'd)	S-021.28 (cont'd)	Marine Habitat	Marine Protected Areas	(cont'd) proposed cables and manner of construction that is intended to occur specifically within the boundaries of North Florida MPA.	See above.
Ocean Conservancy / Cornish, Vicky	NGO-005.3	Marine Mammal	Distribution	Urges the Navy to complete marine mammal surveys as it has done in Onslow Bay, to fully understand the community.	In February 2009, the Navy began implementing a program that is monitoring potential effects to marine mammals at the Jacksonville USWTR site.
Ocean Conservancy / Koelsch, Jessica	NGO-006.1	Marine Mammal	Distribution	There is not much historical data on whales in the Jacksonville range, urges surveys to complete data needed before distribution and density can be determined.	In February 2009, the Navy began implementing a program that is monitoring potential effects to marine mammals at the Jacksonville USWTR site.

Name/Agency	Letter Number	Comment Category	Comment Subcategory	Comments	Response
Provincetown Center for Coastal Studies / Delaney, Richard F.	NGO-011.1	Marine Mammal	Distribution	Humpback whales in VACAPES area come from Gulf of Maine populations (45.5%), Newfoundland/Gulf of St. Lawrence populations. Stranded whales were 81.2% yearlings, 14.6% immature, 4.2% adults. Mid-Atlantic may be a winter humpback feeding ground. Mortality rate for GoM population may be significant. DEIS does not include discussion of impact on the larger population.	No mortalities are expected for humpback whales in the VACAPES area or any of the alternative USWTR locations. Activities associated with USWTR are not anticipated to result in mortality or injury to any humpback whales. Therefore, USWTR activities will not contribute to the mortality rate of the GoM population. NMFS will consider population effects from all activities during the process of the Section 7 consultation and in their future issuance of the LOA.
Cetacean Society International / Rossiter, William	NGO-014.25	Marine Mammal	Distribution	Marine Mammal surveys have been conducted for Site C and D, but not A. These are vital for meaningful conclusions.	In February 2009, the Navy began implementing a program that is monitoring potential effects to marine mammals at the Jacksonville USWTR site.
New England Aquarium	NGO-016.1	Marine Mammal	Distribution	Concern for expedited FEIS without reliable marine mammal distribution data, despite previous requests.	In February 2009, the Navy began implementing a program that is monitoring potential effects to marine mammals at the Jacksonville USWTR site.

Name/Agency	Letter Number	Comment Category	Comment Subcategory	Comments	Response
New England Aquarium	NGO-016.4	Marine Mammal	Distribution	New England Aquarium's database shows several photographed incidences of right whales in the area of USWTR, therefore, more comprehensive surveys are required.	EIS acknowledges that right whales can be found in USWTR. In February 2009, the Navy began implementing a program that is monitoring potential effects to marine mammals at the Jacksonville USWTR site.
Southern Environmental Law Center / Wannamaker, Catherine M.	NGO-017.28	Marine Mammal	Distribution	Bycatch of dolphins is above allowable removal levels, making the current population depleted.	Prior to training on the range, the Navy will obtain a letter of authorization (LOA) for effects to marine mammals. NMFS will consider population effects from all activities in their issuance of a LOA.
Southern Environmental Law Center / Wannamaker, Catherine M.	NGO-017.29	Marine Mammal	Distribution	DEIS (4.3-93) assumption that all bottlenose dolphins are from western North Atlantic offshore stock is unsupported. Distribution and mixing of populations is unknown at this time.	Please refer to revised Subchapter 4.3.9.1 and the referenced Waring et al., 2008.
Earthjustice / Renshaw, Katie	NGO-019.30	Marine Mammal	Distribution	More information required on species, age class distributions, and dive duration - to estimate numbers not seen during regular surveys.	The EIS represents the best available and most applicable science on species, age class distributions, and dive duration.

Name/Agency	Letter Number	Comment Category	Comment Subcategory	Comments	Response
Citizens Opposing Active Sonar Threats (COAST) / Wray, Russell	NGO-025.36	Marine Mammal	Distribution	Little is known of density, breeding areas, or metapopulation numbers or dynamics for many species. Other species may still exist, and other populations may be endangered. Populations may be resident in USWTR site. With these uncertainties, DEIS conclusions are highly questionable.	The EIS represents the best available and most applicable science.
Citizens Opposing Active Sonar Threats (COAST) / Wray, Russell	NGO-025.38	Marine Mammal	Distribution	What impact would USWTR have on species genetic makeup if it disrupts a local population?	The USWTR range is a relatively very small area versus most marine mammal habitat areas. The results of analyses of impacts of training on USWTR (see Chapter 4) show that it would not disrupt marine mammal populations. The Navy has consulted with NMFS regarding required mitigation measures (see Chapter 6).

Name/Agency	Letter Number	Comment Category	Comment Subcategory	Comments	Response
Natural Resources Defense Council (NRDC)	NGO-026.34	Marine Mammal	Distribution	Navy cites outdated research on marine mammal (including right whale) habitat and distribution. Including heavy reliance on CETAP data that is 25+ years old. Newer citation show wider ranges.	General distribution information comes from multiple sources, including CETAP reports (Winn et al, 1986) through 2007. Area-specific distribution and occurrence information are based upon the marine resource assessments (MRAs - available on the USWTR website) for the Southeast OPAREAs. The occurrence information is mapped using a combination of sighting, stranding, and bycatch data; obtained from a variety of sources including the North Atlantic Right Whale Consortium Database, VA Aquarium, federal and state stranding databases, universities, and NMFS surveys. Discussions of data sources used to determine distribution for the OPAREAs are from MRAs, and EIS Appendix A. For the CHSN/JAX OPAREA and Site A USWTR, as well Site B USWTR, the data used range from 1978-2008. The data for the area-specific distribution in the VACAPES and CHPT OPAREAs (Sites C and D USWTR) also range from 1978-2008. Although references provided may not have been specifically included in the MRA or subsequent EIS analysis, Navy has reviewed the information provided and determined it to be consistent with previous conclusions.

Name/Agency	Letter Number	Comment Category	Comment Subcategory	Comments	Response
Natural Resources Defense Council (NRDC)	NGO-026.50	Marine Mammal	Distribution	DEIS does not appear to consult state and private databases of marine mammal distribution, or NMFS research pertinent to density.	The occurrence information is mapped using a combination of sighting, stranding, and bycatch data obtained from a variety of sources including but not limited to, the North Atlantic Right Whale Consortium Database, Virginia Aquarium, federal and state stranding databases, multiple universities, and NMFS surveys. Complete discussions of the data sources used in determining distribution and occurrence for the OPAREAs can be found in the MRAs, Appendix A. These MRAs were finalized in 2008 and are available to the public through the USWTR project website. For the CHSN/JAX OPAREA, and thus the proposed Site A USWTR as well as proposed Site B USWTR, the data used to determine the distribution and occurrence of species range from 1978 to 2008. The data for the area-specific distribution in the VACAPES and CHPT OPAREAs (Sites C and D USWTR) also range from 1978 to 2008. Density estimates for species were derived from data collected by NMFS shipboard surveys from the period of 1998 to 2005 (See NODE Report for Southeast OPAREAs for complete list of sources and methodology).

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Natural Resources Defense Council (NRDC)	NGO-026.52	Marine Mammal	Distribution	DEIS lacks density information on many species, the contained risk assessments are therefore inappropriate.	Density estimates have been generated based on available data in coordination with technical staff from NMFS Science Centers. All species that regularly occur in sufficient numbers have been included in the density estimation process.
Natural Resources Defense Council (NRDC)	NGO-026.53	Marine Mammal	Distribution	DEIS does not mention complex stocks, i.e. that some marine mammals are managed as multiple populations, with different pressures.	Bottlenose dolphins and humpback whales are the only species within the analysis that have identified stocks (based on NMFS stock assessment reports). Density figures from NMFS do not differentiate those stocks, and there is insufficient information to actually manage these stocks individually at this time and it is not possible to determine the proportion of estimated harassments that could be attributed to each individual stock.

Name/Agency	Letter Number	Comment Category	Comment Subcategory	Comments	Response
Natural Resources Defense Council (NRDC)	NGO-026.54	Marine Mammal	Distribution	New techniques and data are vital to understanding stocks, but it is not clear that DEIS has considered these.	Occurrence information is mapped using a combination of sighting, stranding, and bycatch data obtained from a variety of sources including but not limited to, the North Atlantic Right Whale Consortium Database, Virginia Aquarium, federal and state stranding databases, multiple universities, and NMFS surveys. Discussions of the data sources used in determining distribution and occurrence can be found in the MRAs (available on the USWTR public Web site), and EIS Appendix A. For the CHSN/JAX OPAREA, and thus the proposed Alternatives A and B, the data used to determine the distribution and occurrence of species covers 1978-2008. The data for the area-specific distribution in the VACAPES and CHPT OPAREAs (Alternatives C and D) also covers 1978-2008. Density estimates for species were derived from data collected by NMFS shipboard surveys from the period of 1998-2005 (See NODE Report for Southeast OPAREAs (on the USWTR Web site) for complete list of sources and methodology).

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Natural Resources Defense Council (NRDC)	NGO-026.57	Marine Mammal	Distribution	Surveys taking place during a single season are insufficient. e.g. Right whale surveys only took place during July-Sept, though they have a more southern distribution in winter.	NMFS stock assessment report relies on data from three specific surveys to establish the population estimates. The EIS uses data from a much broader range of sources as compiled through the Marine Resource Assessments (MRA). The occurrence information is mapped using a combination of sighting, stranding, and bycatch data obtained from a variety of sources including but not limited to, the North Atlantic Right Whale Consortium Database, Virginia Aquarium, federal and state stranding databases, multiple universities, and NMFS surveys. Complete discussions of the data sources used in determining distribution and occurrence for the OPAREAs can be found in the MRAs, and Appendix A of the EIS. These MRAs were finalized in 2008 and are available to the public through the USWTR project website.
Natural Resources Defense Council (NRDC)	NGO-026.58	Marine Mammal	Distribution	DEIS does not assess risk to bottlenose dolphins in any site other than Site C.	Risk to bottlenose dolphins are included for all sites and exposure estimates are provided in Tables 4.3-7 through 4.3-10.
Natural Resources Defense Council (NRDC)	NGO-026.59	Marine Mammal	Distribution	Use of only shipboard surveys for density estimates likely underestimate risk, focused research required.	In February 2009, the Navy began implementing a program that is monitoring potential effects to marine mammals at the Jacksonville USWTR site utilizing both shipboard and aerial surveys.

Name/Agency	Letter Number	Comment Category	Comment Subcategory	Comments	Response
Natural Resources Defense Council (NRDC)	NGO-026.60	Marine Mammal	Distribution	DEIS does not consider sources beyond NMFS stock assessments, inclusion of other sources could increase accuracy.	The occurrence information is mapped using a combination of sighting, stranding, and bycatch data obtained from a variety of sources including but not limited to, the North Atlantic Right Whale Consortium Database, Virginia Aquarium, federal and state stranding databases, multiple universities, and NMFS surveys. Complete discussions of the data sources used in determining distribution and occurrence for the OPAREAs can be found in the MRAs, Appendix A. These MRAs were finalized in 2008. For the CHSN/JAX OPAREA, and thus the proposed Site A USWTR as well as proposed Site B USWTR, the data used to determine the distribution and occurrence of species range from 1978 to 2008. The data for the area-specific distribution in the VACAPES and CHPT OPAREAs (Sites C and D USWTR) also range from 1978 to 2008. Density estimates for species were derived from data collected by NMFS shipboard surveys from the period of 1998 to 2005 (See NODE Report for Southeast OPAREAs for complete list of sources and methodology). MRAs NODE Report are available on the USWTR project website.

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Natural Resources Defense Council (NRDC)	NGO-026.61	Marine Mammal	Distribution	Assumption of uniform distribution is not necessarily a conservative approach, versus DEIS claim. Impact assessments may be over- or underestimated due to patchiness of populations.	Please see revised text in Subchapter 4.3.7.1.
Natural Resources Defense Council (NRDC)	NGO-026.82	Marine Mammal	Distribution	Exclusion of pinnipeds improper: NMFS stock assessment show harbor seal, harp seal, hooded seal are seen along the coasts, and therefore should be included.	Although pinnipeds have been observed along the coasts ranging throughout the southeast they have been limited to very nearshore coastal waters or, more commonly, on the beach. The majority of pinniped sightings in the southeast occur along the NC coast during the colder winter months. Despite some limited seasonal occurrence, densities within the southeast (including at the Wallops proposed site) are so low that the effective density is near zero and these species were eliminated from the modeling process.

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Natural Resources Defense Council (NRDC)	NGO-026.83	Marine Mammal	Distribution	Navy is obliged to examine all impacts of activities on manatees - cable installation may take place in preferred seagrass habitat, sonar can reverberate great distances and may reach manatees.	All available mapping indicates that seagrass is not present along the USWTR trunk cable corridor. However, if seagrass beds are found to be present within the project area, they would be avoided by directional drilling under or around the bed. Directional drilling would begin on land and tunnel under benthic habitats (e.g., sea grasses) for a distance of 2,000-4,000 ft. Tunneling would be deep enough so as not to disturb fauna and flora present of the sea floor's surface. If the conduit's termination point (where the conduit exits the sea floor) cannot be positioned to avoid a sea grass bed, the impacts to the bed would be minimal (an area less than 10 sq ft). Any impacts to sea grass beds would be mitigated in coordination with the regulatory agencies. Manatees are not expected to be closer than 45 NM to USWTR sonar sources, at this distance, sonar sound would be very low. Reverberations such as those that occurred in the 2000 Bahamas stranding event are not likely to occur in the USWTR Range due to different bathymetric features.

Name/Agency	Letter Number	Comment Category	Comment Subcategory	Comments	Response
Dereszynski, Nyla	P-010.2	Marine Mammal	Distribution	Marine mammal populations are so dense that they will always be present during testing.	The densities for most marine mammal species are actually relatively low. It takes a significant amount of survey effort to determine marine mammal densities. Through the Navy's marine mammal monitoring program, we will be able to establish baseline occurrence information.
Sutherland, Kate	P-044.2	Marine Mammal	Distribution	Northern portions of alternative Site C is beaked whale habitat.	The Navy has reviewed data regarding the observations of beaked whales. The data are from an area around Cape Hatteras, 200 km to the north of alternative Site C. The oceanography and ecology of this particular area is significantly different than the conditions at Site C due to the influence by the Hatteras Front. This area has been identified as an area with relatively high diversity and abundance of marine species. A discussion of this information has been added to Subchapter 3.2.6.
Van Saum, David	P-058.2	Marine Mammal	Distribution	Navy sighting records over 20+ years show that right whales stay close to shore.	Comment noted.
Turnboll, Norm, Jr.	P-059.1	Marine Mammal	Distribution	Same uncertainty of marine mammal distribution (within Jacksonville range) exists throughout Atlantic Coast. Jacksonville is a safe area to train, and therefore the Navy should do so.	Comment noted.

Name/Agency	Letter Number	Comment Category	Comment Subcategory	Comments	Response
Tuohy, Matthew W.	P-061.2	Marine Mammal	Distribution	Jacksonville alternative will be 30 miles from right whale calving ranges, and mitigation procedures are in place to minimize impact.	Comment noted.
Neal, Tyler	P-087.4	Marine Mammal	Distribution	Doubts of cessation of exercises due to marine mammal presence, as they will always be present due to dense populations.	The densities for most marine mammal species are actually relatively low. It takes a significant amount of survey effort to determine marine mammal densities. Through the Navy's marine mammal monitoring program, we will be able to establish baseline occurrence information.

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GA Dept of Natural Resources (GADNR) / Holcomb, Noel	S-018.3	Marine Mammals	Distribution	We question the accuracy of the Acoustic Effects Analysis given how little is known about the density data at the heart of the analysis (i.e. Navy OPAREA Density Estimates) are spatially and temporally coarse in scale, and therefore inappropriate for fine- scale analysis that was conducted in the DEIS/OEIS. Rather, we recommend that comprehensive marine mammal surveys be conducted within the proposed USWTR area across all seasons in order to calculate accurate season-specific estimates of marine mammal density. This point is particularly important for North Atlantic right whales because the density of right whales beyond 30 NM of shore in unknown. Accurate right whale density estimates for waters beyond 30 NM are needed in order to predict impacts to right whales. The revised density estimates should be incorporated into the Acoustic Effects Analysis prior to publication of the Final EIS;	The Navy OPAREA Density Estimates (NODES) report has been placed on the project web site; it utilizes the best available method in density modeling. Navy used aerial and ship-board survey data from National Marine Fisheries Service going back to 1998 to develop these density estimates.

Name/Agency	Letter Number	Comment Category	Comment Subcategory	Comments	Response
GA Dept of Natural Resources (GADNR) / Holcomb, Noel (cont'd)	S-018.3 (cont'd)	Marine Mammals	Distribution	(cont'd) they should also be considered by NMFS prior to issuing a Letter of Authorization (LOA) or consulting with the Navy under Section 7 of the Endangered Species Act (ESA).	See above.
Southern Environmental Law Center / Wannamaker, Catherine M.	NGO-017.16	Marine Mammal	Entanglement	Conclusion that entanglement will not happen is unsupported by any evidence, and must be reconsidered.	Please refer to Subchapter 4.2.4.2: Control wire has a relatively low breaking strength (19 kg [42 lb]). Torpedo control wire is pulled from the torpedo in a relatively straight line, and its physical characteristics prevent it from tangling. Due to flex hose stiffness and weight, it would not tangle and would rapidly fall to the ocean floor.
Southern Environmental Law Center / Wannamaker, Catherine M.	NGO-017.17	Marine Mammal	Entanglement	Right whales do feed in contact with ocean bottom, described by the DEIS as a condition for entanglement in control wires (4.2-24).	Please refer to Subchapter 4.2.4.2: Control wire has a relatively low breaking strength (19 kg [42 lb]). Due to stiffness of torpedo control wires and flex hoses, DoN 1996b analysis predicts insignificant potential for entanglement.
Southern Environmental Law Center / Wannamaker, Catherine M.	NGO-017.18	Marine Mammal	Entanglement	Navy does not provide evidence that visibility of parachute and suspension lines will reduce entanglement by marine mammals.	Parachutes for sonobuoys are generally 8-12" in diameter. Suspension lines are not long (approximately 2 ft) and will not likely result in entanglement.

Name/Agency	Letter Number	Comment Category	Comment Subcategory	Comments	Response
Southern Environmental Law Center / Wannamaker, Catherine M.	NGO-017.19	Marine Mammal	Entanglement	Non-lethal entanglements can still weaken marine mammals.	Comment noted. Risk of entanglements is insignificant.
Southern Environmental Law Center / Wannamaker, Catherine M.	NGO-017.30	Marine Mammal	Entanglement	If dolphins are present, potential entanglement in USWTR gear is at odds with the measures of the Take Reduction Plan.	Risk of entanglement is insignificant. Please refer to Subchapter 4.2.4.2: control wire has a relatively low breaking strength (19 kg [42 lb]). Torpedo control wire is pulled from the torpedo in a relatively straight line, and its physical characteristics prevent it from tangling. Due to flex hose stiffness and weight, it would not tangle and would rapidly fall to the ocean floor.
Citizens Opposing Active Sonar Threats (COAST) / Wray, Russell	NGO-025.56	Marine Mammal	Entanglement	Assumption that marine mammals will not be affected as they rarely use the seafloor is flawed as impacts can still occur during periods they do dive near floor.	Range installation methods are similar to trans-Atlantic communication cables; there is no evidence of impacts to marine mammals during the installation. Please refer to mitigation measures in Subchapter 6.4. Once instrumentation is in place, it would not pose an entanglement risk.
Citizens Opposing Active Sonar Threats (COAST) / Wray, Russell	NGO-025.60	Marine Mammal	Entanglement	Marine mammals can be curious about debris, and may become entangled.	Please refer to Subchapter 4.2.4.2. Torpedo control wire has a relatively low breaking strength (19 kg [42 lb]). Torpedo control wire is pulled from the torpedo in a relatively straight line, and its physical characteristics prevent it from tangling. Due to flex hose stiffness and weight, it would not tangle and would rapidly fall to the ocean floor.

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Citizens Opposing Active Sonar Threats (COAST) / Wray, Russell	NGO-025.62	Marine Mammal	Entanglement	Billowing not as temporary as DEIS claims, entanglement with bottom feeders (including humpback, sperm and right whales) likely. Other non-bottom feeders may swim along sea floor, leading to entanglements.	Sonobuoy parachutes are generally 8-12" in diameter. Suspension lines are not long and will not likely result in entanglement.
Citizens Opposing Active Sonar Threats (COAST) / Wray, Russell	NGO-025.63	Marine Mammal	Entanglement	Marine mammals can have very large mouths, and therefore can be capable of swallowing entire parachutes.	Comment noted.
Citizens Opposing Active Sonar Threats (COAST) / Wray, Russell	NGO-025.64	Marine Mammal	Entanglement	Torpedo wire may wrap around an animal in such as way as it can't be broken, resulting in irritation and/or infection.	Please refer to Subchapter 4.2.4.2: Torpedo control wire has a relatively low breaking strength (19 kg [42 lb]). Torpedo control wire is pulled from the torpedo in a relatively straight line, and its physical characteristics prevent it from tangling.
Citizens Opposing Active Sonar Threats (COAST) / Wray, Russell	NGO-025.65	Marine Mammal	Entanglement	Torpedo wire and flex hose on seafloor may entangle if snagged.	Risk of entanglement is insignificant. Please refer to Subchapter 4.2.4.2: control wire has a relatively low breaking strength (19 kg [42 lb]). Torpedo control wire is pulled from the torpedo in a relatively straight line, and its physical characteristics prevent it from tangling. Due to flex hose stiffness and weight, it would not tangle and would rapidly fall to the ocean floor.

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Office of the Mayor of Jacksonville / McCarthy, Julian	L-001.3	Marine Mammal	Right Whale	Right whales stay close to shore, as mothers are trying to keep the calves safe from great white sharks	Comment noted.
Jacksonville Chamber of Commerce / Haley, John	L-002.4	Marine Mammal	Right Whale	Right whales are important, but they remain closer to shore than the USWTR, and are likely adequately protected. Trusts the Navy's determination of risk.	Comment noted.
Natural Resources Defense Council (NRDC)	NGO-002.2	Marine Mammal	Right Whale	Concern for proximity of USWTR to right whale critical habitat and breeding grounds.	Site A range is far offshore from recognized right whale critical habitat. The Navy will be implementing mitigation measures as stated in Chapter 6. The Navy initiated a program in the spring of 2009 that is monitoring marine mammals at the Jacksonville USWTR site. Through the Navy's marine mammal monitoring program, we will be able to establish baseline occurrence information. The Navy is coordinating with NMFS under Section 7 of the ESA, and will coordinate under MMPA, and will implement any additional required mitigation measures.

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Lynch & Eatman, LLP	NGO-003.2	Marine Mammal	Right Whale	Jacksonville alternative is dangerously close to habitat for right whale, and development of the USWTR will undoubtedly impact the endangered species.	Site A range is far offshore from recognized right whale critical habitat. The Navy will be implementing mitigation measures as stated in Chapter 6. The Navy initiated a program in the spring of 2009 that is monitoring marine mammals at the Jacksonville USWTR site. Through the Navy's marine mammal monitoring program, we will be able to establish baseline occurrence information. The Navy is coordinating with NMFS under the ESA and will coordinate under MMPA, and will implement any required mitigation measures.
Ocean Conservancy / Cornish, Vicky	NGO-005.1	Marine Mammal	Right Whale	FL and GA coasts are the only known calving area of the North Atlantic Right Whale, and the impacts of USWTR would further endanger the species.	Site A range is far offshore from recognized right whale critical habitat. The Navy will be implementing mitigation measures as stated in Chapter 6. The Navy initiated a program in the spring of 2009 that is monitoring marine mammals at the Jacksonville USWTR site. Through the Navy's marine mammal monitoring program, we will be able to establish baseline occurrence information. The Navy is consulting with NMFS under Section 7 of the ESA, and will coordinate under MMPA, and will implement any additional required mitigation measures.

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Ocean Conservancy / Cornish, Vicky	NGO-005.2	Marine Mammal	Right Whale	Mothers and calves are especially vulnerable on the calving grounds, and activity in this area is increasing, USWTR will further increase human activity .	Site A range is far offshore from recognized right whale critical habitat. The Navy does not expect an increase in ship traffic due to planned reductions in vessels over the next five years. The Navy has mitigation measures in place specific to operations conducted within the right whale critical habitat off the GA/FL coasts that include posting additional lookouts, reducing speed and minimizing time spent in this area. As presented in Subchapter 6.2, the Navy proposed monitoring and protection measures to avoid impacts to right whales. The Navy is coordinating with NMFS under Section 7 of the ESA, and will coordinate under MMPA, and will implement any additional required mitigation measures.
Sierra Club / Larson, Tom	NGO-007.2	Marine Mammal	Right Whale	Due to the North Atlantic right whale's endangered status, we should be exceedingly cautious about take numbers.	Comment noted.

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Provincetown Center for Coastal Studies / Delaney, Richard F.	NGO-011.2	Marine Mammal	Right Whale	Provincetown Center is involved with a right whale surveillance program, which produces data sighting and habitat data, and includes a Sighting Advisory System operating in the SE Atlantic - cooperation with which could alert USWTR to presence of right whales.	Sighting Advisory System Data are sent to the Navy's Fleet Area Control and Surveillance Facility (FACSFAC) Jacksonville for transmission to ships operating in the region.
International Fund for Animal Welfare / Flocken, Jeffrey	NGO-013.1	Marine Mammal	Right Whale	Right whales recruit slowly, and have a mortality rate of 4%, NOAA claims loss of a single individual may contribute to extinction.	The loss of any right whale is significant. As presented in Subchapter 6.2, the Navy has proposed a monitoring program and additional protection measures to avoid impacts to right whales.
International Fund for Animal Welfare / Flocken, Jeffrey	NGO-013.3	Marine Mammal	Right Whale	Displacement and ship strikes pose the greatest risk to right whales off GA/FL, both of which could increase from USWTR installation and activities.	The Navy does not expect an increase in ship traffic due to a reduction in the vessels over the next five years. Recovery of torpedoes would primarily be conducted by helicopters; so there would be no significant increase in vessel traffic due to torpedo recovery. Regardless of the location of the range, Kings Bay- and Mayport-based vessels will continue to necessarily transit through the right whale critical habitat for all at-sea training. As presented in Subchapter 6.2, the Navy has proposed monitoring and protection measures to avoid impacts to right whales.

Name/Agency	Letter Number	Comment Category	Comment Subcategory	Comments	Response
International Fund for Animal Welfare / Flocken, Jeffrey	NGO-013.4	Marine Mammal	Right Whale	USWTR sonar could cause short-term displacements or permanent displacement of right whales. Sonar could also disrupt important breeding behavior, disrupting reproduction.	As presented in Subchapter 6.2, the Navy has proposed monitoring and protection measures to avoid impacts to right whales. The Navy his coordinating with NMFS under Section 7 of the ESA, and will coordinate under MMPA, and the potential for acoustic effects to cause biologically significant behavioral disruption will be evaluated, and will implement any required mitigation measures. Sonar will only be used on the range, far from right whale critical habitats.
Cetacean Society International / Rossiter, William	NGO-014.15	Marine Mammal	Right Whale	DEIS discussion of impacts on right whale are insufficient.	The Navy does not concur with this statement. A large portion of the EIS [24 pages, 73 references] specifically discusses impacts and proposed mitigation specifically for the right whale. The right whale conservation is discussed prominently throughout the EIS; Subchapter 6.2 discusses additional mitigation measures to further minimize impact on right whale stocks.

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Cetacean Society International / Rossiter, William	NGO-014.19	Marine Mammal	Right Whale	Mothers with calves will spend more time at the surface, and therefore will be at greater risk of ship strikes.	As presented in Subchapter 6.2, the Navy will implement additional monitoring and protection measures to avoid impacts to right whales within the right whale critical habitat off the GA/FL coasts that include posting additional lookouts, reducing speed, minimizing time spent in this area, and reporting sightings during calving season. The Navy is coordinating with NMFS under the ESA and will coordinate under MMPA, and there may be additional requirements to address concerns regarding right whales as a result of the consultation process. Actual training on the range will occur further offshore than the coastal habitat preferred by mother / calf pairs.
Cetacean Society International / Rossiter, William	NGO-014.26	Marine Mammal	Right Whale	There is variability to the accepted distribution, whales have been found +100km offshore and present during non-calving season. 5 NM buffer is not enough.	The Navy acknowledges that individual right whales may occur in other locations, but the primary distribution of species in observed areas is based on best available data. Please refer to Chapter 6 for mitigation. The Navy is coordinating with NMFS under Section 7 of the ESA, and will coordinate under MMPA,
Cetacean Society International / Rossiter, William	NGO-014.27	Marine Mammal	Right Whale	Sources for right whale info are from the 1980/90's, more accurate information is now available.	Although there are older sources used, they remain relevant. In addition, there are also many more recent scientific documents evaluated in preparation of the EIS, including Knowlton 2002, Nowacek (2004), Ward (2005), Kraus (2005), Parks (2005) and Keller (2006).

Name/Agency	Letter Number	Comment Category	Comment Subcategory	Comments	Response
Cetacean Society International / Rossiter, William	NGO-014.28	Marine Mammal	Right Whale	Loss of only 2 female right whales could cause species extinction, and 80% of known right whale deaths were female.	The loss of any right whale is significant. As presented in Subchapter 6.2, the Navy has proposed a monitoring program and additional protection measures to avoid impacts to right whales. The Navy is coordinating with NMFS under Section 7 of the ESA, and will coordinate under MMPA, and will implement any required mitigation measures.
New England Aquarium	NGO-016.2	Marine Mammal	Right Whale	Navy preposition of 2 aerial+ 6 vessel surveys/month over 08-09 are not adequate, recommend 2-3 aerial surveys per week (over 2 calving seasons). High wind causes mother +calf to move further offshore.	Aerial surveys are only part of a multidisciplinary baseline data collection program being developed to support USWTR monitoring for the proposed range in the Jacksonville OPAREA. The Navy will be implementing mitigation measures as stated in Chapter 6. The Navy initiated a program in the spring of 2009 that is monitoring marine mammals at the Jacksonville USWTR site. Through the Navy's marine mammal monitoring program, we will be able to establish baseline occurrence information. The Navy is coordinating with NMFS under Section 7 of the ESA, and will coordinate under MMPA, and will implement any required mitigation measures. The current plan includes complete coverage of the range as well as associated buffer zone one to two times per month along with shipboard surveys and long-term passive acoustic monitoring.

Name/Agency	Letter Number	Comment Category	Comment Subcategory	Comments	Response
Southern Environmental Law Center / Wannamaker, Catherine M.	NGO-017.22	Marine Mammal	Right Whale	Belief that Level B harassments on 48 right whales won't affect population is suspect.	The Navy will implement mitigation measures as stated in Chapter 6. The Navy initiated a program in the spring of 2009 that is monitoring marine mammals at the Jacksonville USWTR site. Through the Navy's marine mammal monitoring program, we will be able to establish baseline occurrence information. The Navy is coordinating with NMFS under Section 7 of the ESA, and will coordinate under MMPA, and will implement any additional required mitigation measures.
Southern Environmental Law Center / Wannamaker, Catherine M.	NGO-017.23	Marine Mammal	Right Whale	Nowacek et al. (2004) found right whales exposed to 500-4500Hz alter swimming and diving - sound levels of 133-148 dB rd 1μPa would disrupt feeding.	Right whales have not been seen feeding in the southeast calving ground. Mother calf pairs are typically well inshore of the area where sonar will be employed.
Southern Environmental Law Center / Wannamaker, Catherine M.	NGO-017.5	Marine Mammal	Right Whale	Locating USWTR in right whale migration route (Site A or B) fails to account for current evidence. Entire route must be protected due to poor survival rate.	The Navy will implement mitigation measures as stated in Chapter 6. The Navy initiated a program in the spring of 2009 that is monitoring marine mammals at the Jacksonville USWTR site. Through the Navy's marine mammal monitoring program, we will be able to establish baseline occurrence information. The Navy is coordinating with NMFS under Section 7 of the ESA, and will coordinate under MMPA, and will implement any additional required mitigation measures.

Name/Agency	Letter Number	Comment Category	Comment Subcategory	Comments	Response
Southern Environmental Law Center / Wannamaker, Catherine M.	NGO-017.7	Marine Mammal	Right Whale	NMFS, 2003: Loss of a single right whale from an existing population could cause extinction. Therefore, there is no allowable take.	The loss of any right whale is significant. As presented in Subchapter 6.2, the Navy has proposed a monitoring program and additional protection measures to avoid impacts to right whales. The Navy is consulting with NMFS under Section 7 of the ESA, and will coordinate under MMPA, and will implement any additional required mitigation measures.
Southern Environmental Law Center / Wannamaker, Catherine M.	NGO-017.9	Marine Mammal	Right Whale	Ship strikes are the greatest known human cause of mortality to right whales.	The Navy has incorporated protective measures to reduce the potential for ship strikes (refer to revised Chapter 6), which have been shown to be effective in reducing the risk of collisions with surfaced marine mammals. Most activity will be on the ranges far off shore of right whale critical habitats. Regardless of the location of the range, Kings Bay- and Mayport-based vessels will continue to necessarily transit through the right whale critical habitat for all at-sea training. The recently-released Mayport ROD announced that the number of Navy ships based in Mayport is expected to decline from 22 to 12, by 2014; which will reduce Navy traffic and is predicted to offset any increases due to USWTR. The Navy is consulting with NMFS under Section 7 of the ESA and will coordinate under MMPA, with regard to potential impacts to the right whale.

Name/Agency	Letter Number	Comment Category	Comment Subcategory	Comments	Response
Earthjustice / Renshaw, Katie	NGO-019.33	Marine Mammal	Right Whale	Nowacek et al. (2003) shows right whales exposed to 500-4500Hz altered swimming and diving profiles, and that sound levels of 133-148dB re 1μPa would disrupt feeding behavior. DEIS claim of no affect on survival or recruitment at odds with NMFS assessment.	The Navy will implement mitigation measures as stated in Chapter 6. The Navy initiated a program in the spring of 2009 that is monitoring marine mammals at the Jacksonville USWTR site. Through the Navy's marine mammal monitoring program, we will be able to establish baseline occurrence information. The Navy is consulting with NMFS under Section 7 of the ESA, and will coordinate under MMPA, and will implement any additional required mitigation measures.
Ocean Conservancy	NGO-020.1	Marine Mammal	Right Whale	Concern with situation of USWTR close to right whale habitat without properly analyzing impacts or mitigation	As presented in Subchapter 6.2, the Navy will implement additional monitoring and protection measures to avoid impacts to right whales within the right whale critical habitat off the GA/FL coasts that include posting additional lookouts, reducing speed, minimizing time spent in this area, and reporting sightings during calving season. The Navy initiated a program in the spring of 2009 that is monitoring marine mammals at the Jacksonville USWTR site. Through the Navy's marine mammal monitoring program, we will be able to establish baseline occurrence information. The Navy is consulting with NMFS under Section 7 of the ESA, and will coordinate under MMPA, and will implement any additional required mitigation measures.

Name/Agency	Letter Number	Comment Category	Comment Subcategory	Comments	Response
Citizens Opposing Active Sonar Threats (COAST) / Wray, Russell	NGO-025.25	Marine Mammal	Right Whale	Nowacek et al., 2004: Right whales may engage in dramatic surfacing behavior at levels above 133 dB	This is noted in Subchapter 3.2.6.1. Nowacek et al. (2004) data was evaluated in the preparation of the EIS. The Navy is consulting with NMFS under Section 7 of the ESA, and will coordinate under MMPA, and will implement any required mitigation measures.
Citizens Opposing Active Sonar Threats (COAST) / Wray, Russell	NGO-025.26	Marine Mammal	Right Whale	Right whale surfacing behavior (in response to sonar) will increase ship strike potential.	The Navy will implement mitigation measures as stated in Chapter 6. The Navy initiated a program in the spring of 2009 that is monitoring marine mammals at the Jacksonville USWTR site. Through the Navy's marine mammal monitoring program, we will be able to establish baseline occurrence information. The Navy is consulting with NMFS under Section 7 of the ESA, and will coordinate under MMPA, and will implement any additional required mitigation measures.
Citizens Opposing Active Sonar Threats (COAST) / Wray, Russell	NGO-025.29	Marine Mammal	Right Whale	Right whale is endangered, and USWTR can have only negative impacts.	As presented in Subchapter 6.2, the Navy proposed a monitoring program and additional protection measures to avoid impacts to right whales. The Navy is consulting with NMFS under Section 7 of the ESA, and will coordinate under MMPA, and will implement any required mitigation measures.

Name/Agency	Letter Number	Comment Category	Comment Subcategory	Comments	Response
Citizens Opposing Active Sonar Threats (COAST) / Wray, Russell	NGO-025.83	Marine Mammal	Right Whale	Sighting data does not eliminate the possibility that right whales exist further from shore. 20 NM safety zone will not add protection beyond 20 NM.	The Navy will implement mitigation measures as stated in Chapter 6. The Navy initiated a program in the spring of 2009 that is monitoring marine mammals at the Jacksonville USWTR site. Through the Navy's marine mammal monitoring program, we will be able to establish baseline occurrence information. The surveys will cover the USWTR site and provide updated information on right whale distributions in this area. The Navy is consulting with NMFS under Section 7 of the ESA, and will coordinate under MMPA, and will implement any additional required mitigation measures.
Citizens Opposing Active Sonar Threats (COAST) / Wray, Russell	NGO-025.84	Marine Mammal	Right Whale	As USWTR imperils right whales, and they are already exposed to other threats, USWTR should not be placed near calving grounds.	The Navy will implement mitigation measures as stated in Chapter 6. The Navy initiated a program in the spring of 2009 that is monitoring marine mammals at the Jacksonville USWTR site. Through the Navy's marine mammal monitoring program, we will be able to establish baseline occurrence information. The surveys will cover the USWTR site and provide updated information on right whale distributions in this area. The Navy is consulting with NMFS under Section 7 of the ESA, and will coordinate under MMPA, and will implement any additional required mitigation measures.

Name/Agency	Letter Number	Comment Category	Comment Subcategory	Comments	Response
Natural Resources Defense Council (NRDC)	NGO-026.16	Marine Mammal	Right Whale	Sightings indicate that right whales occur as far offshore as directed surveys extend.	The Navy will implement mitigation measures as stated in Chapter 6. The Navy initiated a program in the spring of 2009 that is monitoring marine mammals at the Jacksonville USWTR site. Through the Navy's marine mammal monitoring program, we will be able to establish baseline occurrence information. The surveys will cover the USWTR site and provide updated information on right whale distributions in this area. The Navy is consulting with NMFS under Section 7 of the ESA, and will coordinate under MMPA, and will implement any required mitigation measures.
Natural Resources Defense Council (NRDC)	NGO-026.17	Marine Mammal	Right Whale	Mothers and calves are particularly vulnerable to impacts. They spend more time at shallow depths due to calves' small lung capacity. Loss of a single right whale may contribute to their extinction.	The loss of any right whale is significant. As presented in Subchapter 6.2, the Navy has proposed a monitoring program and additional protection measures to avoid impacts to right whales. The Navy is consulting with NMFS under Section 7 of the ESA, and will coordinate under MMPA, and will implement any required mitigation measures.

Name/Agency	Letter Number	Comment Category	Comment Subcategory	Comments	Response
Natural Resources Defense Council (NRDC)	NGO-026.35	Marine Mammal	Right Whale	Navy acknowledges uncertainty in predicting whale occurrence, but makes no attempt to fill in the gaps for the Jacksonville alternative (as it has attempted for other alternatives).	The Navy will implement mitigation measures as stated in Chapter 6. The Navy initiated a program in the spring of 2009 that is monitoring marine mammals at the Jacksonville USWTR site. Through the Navy's marine mammal monitoring program, we will be able to establish baseline occurrence information. The surveys will cover the USWTR site and provide updated information on right whale distributions in this area. The Navy is consulting with NMFS under Section 7 of the ESA, and will coordinate under MMPA, and will implement any additional required mitigation measures.
Natural Resources Defense Council (NRDC)	NGO-026.36	Marine Mammal	Right Whale	Stranding reports do not include those of right whales, such as events near USWTR alternatives during non-calving season.	There have been no stranding events of North Atlantic right whales associated with the use of sonar by the Navy. The report presented in Appendix E consists of stranding events allegedly linked to sonar operations. None of these events involved North Atlantic right whales.

Name/Agency	Letter Number	Comment Category	Comment Subcategory	Comments	Response
Natural Resources Defense Council (NRDC)	NGO-026.37	Marine Mammal	Right Whale	Right whale seasonal distribution discussion (for each site) is cursory and incomplete/inaccurate.	The Navy will implement mitigation measures as stated in Chapter 6. The Navy initiated a program in the spring of 2009 that is monitoring marine mammals at the Jacksonville USWTR site. Through the Navy's marine mammal monitoring program, we will be able to establish baseline occurrence information. The surveys will cover the USWTR site and provide updated information on right whale distributions in this area. The Navy is consulting with NMFS under Section 7 of the ESA, and will coordinate under MMPA, and will implement any additional required mitigation measures.

Name/Agency	Letter Number	Comment Category	Comment Subcategory	Comments	Response
Natural Resources Defense Council (NRDC)	NGO-026.38	Marine Mammal	Right Whale	Charleston alternative discussion does not mention use of coast by mothers and calves (Restricted Management Area to 35 NM from shore), thereby underestimating risk.	USWTR activity will not impact the Restricted Management Area, as the range's nearest point is 40 NM to shore, and no increase in vessel traffic is predicted. As presented in Subchapter 6.2, the Navy will implement additional monitoring and protection measures to avoid impacts to right whales within the right whale critical habitat off the GA/FL coasts that include posting additional lookouts, reducing speed, minimizing time spent in this area, and reporting sightings during calving season. The Navy is consulting with NMFS under Section 7 of the ESA, and will coordinate under MMPA, and will implement any additional required mitigation measures. The Navy's marine mammal monitoring program will assist in establishing baseline occurrence information.
Natural Resources Defense Council (NRDC)	NGO-026.39	Marine Mammal	Right Whale	Ch.3 & 4 should include sections on altered behavior of mothers and calves, and potential of USWTR to disturb them.	The Navy is consulting with NMFS under Section 7 of the ESA, and will coordinate under MMPA, and will implement any required mitigation measures.

Name/Agency	Letter Number	Comment Category	Comment Subcategory	Comments	Response
Natural Resources Defense Council (NRDC)	NGO-026.41	Marine Mammal	Right Whale	DEIS does not discuss collisions that have occurred with the area of Site D (including collisions that killed pregnant females in 2004).	The Navy has protective measures in place specifically designed to minimize the risk of ship strike (refer to the revised Chapter 6). Protective measures include posting additional lookouts, reducing speed and minimizing time spent in the critical habitat area. In addition, there are right whale protective measures that apply to Navy ships tailored to the location and time of year all along the U.S. Atlantic Coast. Site D is located at the outer extent of the NARW migratory corridor. The Navy is consulting with NMFS under Section 7 of the ESA, and will coordinate under MMPA, and will implement any additional required mitigation measures.
Natural Resources Defense Council (NRDC)	NGO-026.43	Marine Mammal	Right Whale	There may be heavier use of offshore waters than acknowledged, due to anecdotal evidence.	The Navy will implement mitigation measures as stated in Chapter 6. The Navy initiated a program in the spring of 2009 that is monitoring marine mammals at the Jacksonville USWTR site. Through the Navy's marine mammal monitoring program, we will be able to establish baseline occurrence information. The surveys will cover the USWTR site and provide updated information on right whale distributions in this area. The Navy is consulting with NMFS under Section 7 of the ESA, and will coordinate under MMPA, and will implement any additional required mitigation measures.

Name/Agency	Letter Number	Comment Category	Comment Subcategory	Comments	Response
Natural Resources Defense Council (NRDC)	NGO-026.44	Marine Mammal	Right Whale	Site D occurs along migratory route, but DEIS states right whales 'may occur', despite nearby documentation (including collision and entanglement records).	The Navy has protective measures in place specifically designed to minimize the risk of ship strike that include posting additional lookouts, reducing speed and minimizing time spent in the critical habitat area. In addition, there are right whale protective measures that apply to Navy ships tailored to the location and time of year all along the U.S. Atlantic Coast. Site D is located at the outer extent of the NARW migratory corridor. The Navy is consulting with NMFS under Section 7 of the ESA, and will coordinate under MMPA, and mitigation measures required by NMFS will be implemented.
Natural Resources Defense Council (NRDC)	NGO-026.49	Marine Mammal	Right Whale	DEIS relies on bowhead whale data (Richardson, 1999) that likely does not represent right whale behavior due to different circumstances.	The EIS uses the best available and most applicable data. Bowhead data is a reasonable surrogate for responses of mother-calf pair to sonar.

Name/Agency	Letter Number	Comment Category	Comment Subcategory	Comments	Response
Natural Resources Defense Council (NRDC)	NGO-026.6	Marine Mammal	Right Whale	Jacksonville alternative could impact only known right whale calving ground, as well as migratory paths.	The Navy will implement mitigation measures as stated in Chapter 6. The Navy initiated a program in the spring of 2009 that is monitoring marine mammals at the Jacksonville USWTR site. Through the Navy's marine mammal monitoring program, we will be able to establish baseline occurrence information. The surveys will cover the USWTR site and provide updated information on right whale distributions in this area. The Navy is consulting with NMFS under Section 7 of the ESA, and will coordinate under MMPA, and will implement any additional required mitigation measures.
Booher, Sam	P-002.2	Marine Mammal	Right Whale	Concern for impacts to the northern right whale and birthing area.	The Navy will implement mitigation measures as stated in Chapter 6. The Navy initiated a program in the spring of 2009 that is monitoring marine mammals at the Jacksonville USWTR site. Through the Navy's marine mammal monitoring program, we will be able to establish baseline occurrence information. The surveys will cover the USWTR site and provide updated information on right whale distributions in this area. The Navy is consulting with NMFS under Section 7 of the ESA, and will coordinate under MMPA, and will implement any additional required mitigation measures. Site A is located offshore of the recognized critical habitat.

Name/Agency	Letter Number	Comment Category	Comment Subcategory	Comments	Response
Farrah, David	P-005.1	Marine Mammal	Right Whale	Concern for right whale and breeding grounds (as well as marine mammals in general).	The Navy will implement mitigation measures as stated in Chapter 6. The Navy initiated a program in the spring of 2009 that is monitoring marine mammals at the Jacksonville USWTR site. Through the Navy's marine mammal monitoring program, we will be able to establish baseline occurrence information. The surveys will cover the USWTR site and provide updated information on right whale distributions in this area. The Navy is consulting with NMFS under Section 7 of the ESA, and will coordinate under MMPA, and will implement any additional required mitigation measures. Site A is located offshore of the recognized critical habitat.
Matthaei, Julie	P-018.1	Marine Mammal	Right Whale	Request that the Navy not build a sonar range in the right whale calving area of Jacksonville's coast.	Comment noted. None of the proposed alternatives would be in the right whale calving area. The proposed Jacksonville site (Alternative A) is 30NM offshore of calving area.

Name/Agency	Letter Number	Comment Category	Comment Subcategory	Comments	Response
Cross, David and Rita	P-039.1	Marine Mammal	Right Whale	Concern that USWTR will be placed in migratory route of endangered right whales, due to negative impacts of high-intensity sonar on whales.	The proposed USWTR range at the Jacksonville site is seaward of the known right whale migration route. The Navy initiated a program in the spring of 2009 that is monitoring marine mammals at the Jacksonville USWTR site. Through the Navy's marine mammal monitoring program, we will be able to establish baseline occurrence information. The surveys will cover the USWTR site and provide updated information on right whale distributions in this area. The Navy is consulting with NMFS under Section 7 of the ESA, and will coordinate under MMPA, and will implement any additional required mitigation measures.
Booher, Sam	P-040.1	Marine Mammal	Right Whale	Jacksonville range is not outside area frequented by right whales, and that sonar will harm whale calves. Range is only ~10 miles from recognized right whale habitat. Impact will be significant.	The proposed USWTR range at the Jacksonville site is seaward of the known right whale migration route. Mitigation measures will be implemented and the monitoring program will assess the potential occurrence of right whales in or near the Jacksonville USWTR site. The Navy is consulting with NMFS under Section 7 of the ESA, and will coordinate under MMPA, and will implement any additional required mitigation measures.

Name/Agency	Letter Number	Comment Category	Comment Subcategory	Comments	Response
Armstrong, Frances T.	P-069.3	Marine Mammal	Right Whale	DEIS fails to acknowledge risks to marine species, including right whale.	Document addresses the risks to marine species. Subchapter 4.3 includes the biological framework analysis.
Guidi, William and Doris	P-073.2	Marine Mammal	Right Whale	Concern for sonar impact on right whale.	Please refer to Subchapter 6.2. Mitigation measures will be implemented and the monitoring program will assess the potential occurrence of right whales in or near the Jacksonville USWTR site. The Navy is consulting with NMFS under Section 7 of the ESA, and will coordinate under MMPA, and will implement any additional required mitigation measures.
White County Intermediate, Third Grade Class	P-084.1	Marine Mammal	Right Whale	Concern for right whale.	Comment noted. Please refer to Subchapters 4.3 and 6.2 in the EIS for impact analysis and mitigation measures to protect right whales. Mitigation measures will reduce potential impacts to the right whale. The Navy is consulting with NMFS under Section 7 of the ESA, and will coordinate under MMPA, and will implement any additional required mitigation measures.

Name/Agency	Letter Number	Comment Category	Comment Subcategory	Comments	Response
White County Intermediate, Third Grade Class	P-084.2	Marine Mammal	Right Whale	Right whale, as GA's official marine mammal, deserves additional consideration.	Please refer to Subchapter 6.2. The Navy initiated a program in the spring of 2009 that is monitoring marine mammals at the Jacksonville USWTR site. The Navy is consulting with NMFS under Section 7 of the ESA, and will coordinate under MMPA, and will implement any additional required mitigation measures.
Phibbs, Marilyn	P-098.1	Marine Mammal	Right Whale	Urges protection of right whales.	Please refer to Subchapters 4.2, 4.3, 6.1, and 6.2 for analysis of impacts and mitigation measures specific to the right whale. The Navy is consulting with NMFS under Section 7 of the ESA, and will coordinate under MMPA, and will implement any additional required mitigation measures.

Name/Agency	Letter Number	Comment Category	Comment Subcategory	Comments	Response
FL Fish and Wildlife Conservation Commission (FFWCC) / Poole, Mary Ann	S-021.5	Marine Mammal	Right Whale	All proposed sites should receive an NMFS Section 7 review for potential impacts to right whales as all sites are along the migratory path of right whales moving from their feeding grounds to their calving grounds. Knowledge of spatial and temporal extent of offshore migratory paths is limited, as noted above, although evidence indicates that at least some right whales are found at a distance from shore consistent with USWTR placement. The distance from shore of any of the proposed sites (Charleston OPAREA at 74 km, VACAPES OPAREA at 63 km offshore, Cherry Point OPAREA at 86 km, and Jacksonville OPAREA at 96 km offshore) does not preclude the presence of right whales; therefore, section 7 consultation is prudent for any of the proposed locations of the USWTR.	The Navy has initiated Section 7 consultation for the preferred alternative. Should the preferred alternative change, the new site would be the focus of the consultation.

Name/Agency	Letter Number	Comment Category	Comment Subcategory	Comments	Response
FL Fish and Wildlife Conservation Commission (FFWCC) / Poole, Mary Ann	S-021.6	Marine Mammal	Right Whale	We recommend that any mitigation measures should not be limited solely to the confines of the designated federal critical habitat boundaries, as large concentrations of right whales have been documented outside of the defined critical habitat boundary.	The Navy has developed their stranding response plan in coordination with the National Marine Fisheries Service, a cooperating agency on the EIS.
Provincetown Center for Coastal Studies / Delaney, Richard F.	NGO-011.3	Marine Mammal	Ship Strike	Vessels strikes are primary human cause of death for right whales, and a major cause of death for humpbacks.	The Navy has incorporated protective measures to reduce the potential for ship strikes (refer to revised Chapter 6), which have been shown to be effective in reducing the risk of collisions with surfaced marine mammals. Most activity will be on the ranges far off shore of right whale critical habitats. Regardless of the location of the range, Kings Bay- and Mayport-based vessels will continue to necessarily transit through the right whale critical habitat for all at-sea training. The recently-released Mayport ROD announced that the number of Navy ships based in Mayport is expected to decline from 22 to 12, by 2014; which will reduce Navy traffic and is predicted to offset any increases due to USWTR. The Navy is consulting with NMFS under Section 7 of the ESA, and will coordinate under MMPA, and will implement any additional required mitigation measures.

Name/Agency	Letter Number	Comment Category	Comment Subcategory	Comments	Response
Southern Environmental Law Center / Wannamaker, Catherine M.	NGO-017.10	Marine Mammal	Ship Strike	Ship strike mortality likely underestimated due to delayed death, post-strike - from chronic injuries resulting from strike.	The EIS uses the best available and most applicable science to assess the potential for collisions with marine mammals or sea turtles, and for resulting mortality. Please refer to Subchapter 4.2.4.4.
Southern Environmental Law Center / Wannamaker, Catherine M.	NGO-017.11	Marine Mammal	Ship Strike	DEIS acknowledges right whale presence (Jacksonville OPAREA) but doesn't assess likelihood of ship strikes due to increased ship traffic.	The Navy has incorporated protective measures to reduce the potential for ship strikes (refer to revised Chapter 6), which have been shown to be effective in reducing the risk of collisions with surfaced marine mammals. Most activity will be on the ranges far off shore of right whale critical habitats. Regardless of the location of the range, Kings Bay- and Mayport-based vessels will continue to necessarily transit through the right whale critical habitat for all at-sea training. The recently-released Mayport ROD announced that the number of Navy ships based in Mayport is expected to decline from 22 to 12, by 2014; which will reduce Navy traffic and is predicted to offset any increases due to USWTR. The Navy is coordinating with NMFS under Section 7 of the ESA with regard to potential impacts to the right whale.

Name/Agency	Letter Number	Comment Category	Comment Subcategory	Comments	Response
Southern Environmental Law Center / Wannamaker, Catherine M.	NGO-017.48	Marine Mammal	Ship Strike	Impact on manatees possible during installation. As ship strikes are the leading cause of death of manatees in FL: detail manatee density, the number of boats and their activity during cable installation, and potential direct and indirect impacts from installation.	During installation, ships proceeds at only 1 or 2 knots. This low speed and the Navy's mitigation measures in Subchapter 6.4 would allow the ship to avoid marine mammals.
Southern Environmental Law Center / Wannamaker, Catherine M.	NGO-017.59	Marine Mammal	Ship Strike	DEIS does not measure the amount of vessel traffic associated with USWTR (including traffic through critical habitat).	The Navy has incorporated protective measures to reduce the potential for ship strikes (refer to revised Chapter 6), which have been shown to be effective in reducing the risk of collisions with surfaced marine mammals. Most activity will be on the ranges far off shore of right whale critical habitats. Regardless of the location of the range, Kings Bay- and Mayport-based vessels will continue to necessarily transit through the right whale critical habitat for all at-sea training. The recently-released Mayport ROD announced that the number of Navy ships based in Mayport is expected to decline from 22 to 12, by 2014; which will reduce Navy traffic and is predicted to offset any increases due to USWTR. The Navy is coordinating with NMFS under Section 7 of the ESA with regard to potential impacts to the right whale.

Name/Agency	Letter Number	Comment Category	Comment Subcategory	Comments	Response
Southern Environmental Law Center / Wannamaker, Catherine M.	NGO-017.8	Marine Mammal	Ship Strike	Fin, humpback, and sperm whales are commonly struck by vessels and are present in Jacksonville OPAREA.	The Navy has incorporated protective measures to reduce the potential for ship strikes (refer to revised Chapter 6), which have been shown to be effective in reducing the risk of collisions with surfaced marine mammals. The recently-released Mayport ROD announced that the number of Navy ships based in Mayport is expected to decline from 22 to 12, by 2014; which will reduce Navy traffic and is predicted to offset any increases due to USWTR. The Navy is coordinating with NMFS under Section 7 of the ESA with regard to potential impacts to the right whale.
Earthjustice / Renshaw, Katie	NGO-019.9	Marine Mammal	Ship Strike	re: 4.2-28: Belief of no ship strikes lacks support and no analysis is made.	Please refer to Subchapter 4.2.4.4. The EIS represents the best available and most applicable science. The Navy is coordinating with NMFS in accordance with Section 7 of the ESA and MMPA. In addition, the Navy has incorporated protective measures to reduce the potential for ship strikes (refer to revised Chapter 6), which have been shown to be effective in reducing the risk of collisions with surfaced marine mammals.
Citizens Opposing Active Sonar Threats (COAST) / Wray, Russell	NGO-025.67	Marine Mammal	Ship Strike	Andre et al. (1997): some whales killed by ship strike had impaired hearing. Exposure to USWTR sonar will increase likelihood of ship strike.	This paper does not cite that the animals were hearing impaired.

Name/Agency	Letter Number	Comment Category	Comment Subcategory	Comments	Response
Wright, Thomas	P-011.2	Marine Mammal	Sightings	Believes that stated operating procedures will detect and protect endangered species.	Comment noted.
Patterson, Brian	P-036.1	Marine Mammal	Sightings	Concern that the DEIS underestimates interactions with beaked whales in Cherry Point alternative, especially in the northern end of the range, where there is a high concentration of whales.	The Navy has funded an intensive ongoing marine mammal survey effort (120+ hours of vessel based and 1500+ km of aerial surveys) at the Onslow site of which, beaked whale presence has not been found within the range site. Concentrations of marine mammals are found further north of the proposed site.
Sutherland, Kate	P-044.3	Marine Mammal	Sightings	Submitter's pelagic bird watching company has submitted beaked whale data to the Navy, but it has not been included in DEIS. They are willing to resubmit data from the past 11 years.	Discussion of this data is contained in Subchapter 3.2.6.3.
Lynch & Eatman, LLP	NGO-003.3	Marine Mammal	Sonar	Use of sonar in Cherry Point Operating Area will have a negative impact on marine mammals.	See Subchapter 4.3 for impact analysis and revised Chapter 6 for mitigation measures aimed at minimizing potential impacts to marine mammals. Cherry Point is no longer the preferred alternative.

Name/Agency	Letter Number	Comment Category	Comment Subcategory	Comments	Response
Sierra Club / Larson, Tom	NGO-007.1	Marine Mammal	Sonar	Whales have a different sense of sound that humans do, and can be heavily impacted by sound.	Comment noted. Please refer to the acoustic and hearing Subchapters within Subchapter 3.2 and Subchapter 4.3 for a discussion on the acoustics criteria and regulatory framework and an assessment of the potential effects from sonar.
Provincetown Center for Coastal Studies / Delaney, Richard F.	NGO-011.7	Marine Mammal	Sonar	A conservative approach is urged, as the effects of sonar and human activity are not well understood, but could be potentially very harmful to marine mammals. In-depth studies on this subject (on range and effects of noise produced on nursery, migration and foraging behaviors) should be carried about as part of EIS.	The EIS represents the best available and most applicable science. The Navy is funding further research on this issue, and will be conducting monitoring of the ranges (see revised Chapter 6)
International Fund for Animal Welfare / Flocken, Jeffrey	NGO-013.2	Marine Mammal	Sonar	Right whales may be particularly sensitive to mid-freq sonar. Nowacek et al (2004) observed reaction from 0.5-4.5 kHz, causing whales to abandon foraging, with surfacing behavior, which can make ship strikes more likely.	Data from Nowacek et al. (2004) was considered in the modeling. Safety zones will be applied beginning at 3,000 feet. Active sonar transmissions would cease if a marine mammal was detected within 600 feet. See revised Chapter 6 for mitigation measures aimed at minimizing potential impacts to marine mammals.

Name/Agency	Letter Number	Comment Category	Comment Subcategory	Comments	Response
Cetacean Society International / Rossiter, William	NGO-014.13	Marine Mammal	Sonar	No mention of herding behavior, which can lead a single panicked individual to start a stampede away from the sonar which continues until exhaustion or obstacle (such as a beach), obviously a detrimental situation.	Please refer to discussion of analytical framework in Subchapter 4.3.1.
Cetacean Society International / Rossiter, William	NGO-014.23	Marine Mammal	Sonar	Whales may be impacted by 'masked' sounds as well.	Please refer to Subchapter 4.3.1.3.1.2 - Perception, for discussion of masking. The sonar signals from the proposed USWTR active sonar activities are likely within the hearing range of some marine mammal species and may mask communication signals between individuals of the same species. Most of the sounds generated by USWTR active sonar activities have short pulse lengths (on the order of seconds), have low duty cycles (ping only one to a few times per minute), operate within a narrow band of frequencies (typically less than one-third octave), and are transient as a source passes through an area. Because of the intermittent nature and narrow frequency band of most of the sonar transmissions, marine mammals should still be able to hear biologically important sounds from other marine mammals, predators, and environmental cues. For this reason, the chance of sonar operations causing masking effects is considered negligible.

Name/Agency	Letter Number	Comment Category	Comment Subcategory	Comments	Response
Cetacean Society International / Rossiter, William	NGO-014.24	Marine Mammal	Sonar	Lowered range of hearing (from sonar) may impact fitness by lowering a whale's ability to hear other whales (impacts to foraging, herding behavior).	This is considered by the risk function (refer to Subchapter 4.3.3.1). Mitigation measures listed in Chapter 6 should minimize impacts to marine mammals by sonar.
Cetacean Society International / Rossiter, William	NGO-014.3	Marine Mammal	Sonar	Early evidence shows that sonar affects marine mammal behavior, and may have a population-level significance.	The EIS represents the best available and most applicable science. The USWTR range is a relatively very small area versus most marine mammal habitat areas. The results of analyses of impacts of training on USWTR (see Chapter 4) show that it would not disrupt marine mammal populations. The Navy has consulted with NMFS regarding required mitigation measures (see Chapter 6). Prior to training on the range, the Navy will obtain a letter of authorization (LOA) for effects to marine mammals. NMFS will consider population effects from all activities in their issuance of a LOA.
Cetacean Society International / Rossiter, William	NGO-014.4	Marine Mammal	Sonar	Active sonar can be sensed by marine mammals miles from the source, and can precipitate negative behavior impacts even when physical evidence is not present.	Risk function covers exposures down to 120 dB (approximately 147 km) to account for this possibility. Please refer to Subchapter 4.3.3.1, including new Table 4.3-1. Also, see conceptual framework in Subchapter 4.3.1.

Name/Agency	Letter Number	Comment Category	Comment Subcategory	Comments	Response
Cetacean Society International / Rossiter, William	NGO-014.6	Marine Mammal	Sonar	U.S. Navy enabled experts to observe marine mammals before and after active sonar during RIMPAC 2008, this data should be included in the DEIS and built upon.	Information concerning RIMPAC 2008 is available at the following Web site: http://www.c3f.navy.mil/RIMPAC_2008.html
Cetacean Society International / Rossiter, William	NGO-014.7	Marine Mammal	Sonar	MoD report of cetacean behavior during Operation Anglo-Saxon in 2006 showed that beaked whales ceased vocalizing and foraging after use of active sonar, which is detrimental to the individual and the population. Research by AUTEC confirms this.	This is addressed by use of the risk function modeling of potential acoustic impacts. Please refer to Subchapter 4.3.3.1.
Cetacean Society International / Rossiter, William	NGO-014.8	Marine Mammal	Sonar	Research must be in actual environment, using actual mid-frequency sonar during real operations. Controlled experiments are not representative as captive animals have no perception of noise as a threat.	The presented Temporary Threshold Shift and Permanent Threshold Shift thresholds are supported by NMFS and are based on the best available science. While recognizing there is incomplete and unavailable information with regard to behavioral impacts on marine mammals, the risk function curve extends to 120 dB SPL specifically to encompass uncertainty and the potential for behavioral reactions in marine mammal species that may be affected by sounds perceived at levels just above ambient in some areas during some parts of the year in east coast waters.

Name/Agency	Letter Number	Comment Category	Comment Subcategory	Comments	Response
Sierra Club (GA Chapter) / Grainey, Karen	NGO-015.1	Marine Mammal	Sonar	Site A's buffer of 30 miles from calving grounds is inadequate, as underwater sound can travel, and mother and calf behavior could be impacted by noise.	The Navy is coordinating with NMFS in accordance with Section 7 under ESA regarding potential impacts to endangered species and any required mitigation.
Southern Environmental Law Center / Wannamaker, Catherine M.	NGO-017.20	Marine Mammal	Sonar	DEIS does not consider that aircraft noise can impact whale behavior, including separating mothers and calves.	Please refer to Subchapter 4.3.11 for discussion of aircraft noise.
Southern Environmental Law Center / Wannamaker, Catherine M.	NGO-017.21	Marine Mammal	Sonar	Improved info on impacts of sonar on whales (including calves) is vital to understanding and mitigating sonar effects.	The Navy supports a number of research efforts that are investigating potential effects of sonar on marine mammals. During 2004-2008, DoN provided over $94 million to support marine research, and has budgeted $22 million for 2009. This research will improve detection and monitoring of marine species, and further evaluate the effect of sound on marine life. The EIS summarizes our current knowledge on the effects of sonar on marine life.
Southern Environmental Law Center / Wannamaker, Catherine M.	NGO-017.24	Marine Mammal	Sonar	DEIS assertion that 108 humpbacks subjected to Level B harassments will not affect recruitment is suspect.	The Navy consulted with NMFS with regards to impacts of USWTR to marine resources and populations. Prior to training on the range, the Navy will obtain a letter of authorization (LOA) for effects to marine mammals. NMFS will consider population effects from all activities in their issuance of a LOA.

Name/Agency	Letter Number	Comment Category	Comment Subcategory	Comments	Response
Southern Environmental Law Center / Wannamaker, Catherine M.	NGO-017.25	Marine Mammal	Sonar	Physiological impact 'congestion of all organs' occur in response to sonar at levels lower than models predict PTS.	Please refer to Subchapter 4.3.1.3.2.1. NOAA has found that frequencies at which resonance (leading to bubble-growth) is predicted to occur are below the frequencies utilized by the sonar systems employed in USWTR. The Navy consulted with NMFS in the development of the risk function.
Southern Environmental Law Center / Wannamaker, Catherine M.	NGO-017.26	Marine Mammal	Sonar	Mid-freq sonar may propagate far enough to cause behavioral modifications far away from USWTR range.	Please refer to revised Subchapter 4.3.3.1, including Figure 4.3-1, concerning distance to effects.
Southern Environmental Law Center / Wannamaker, Catherine M.	NGO-017.27	Marine Mammal	Sonar	DEIS does not consider that multiple exposures to sonar could cause impaired hearing, or starvation (if multiple feedings are interrupted).	Please refer to Subchapter 4.3.4.1. As indicated, prolonged exposure is unlikely as sonar has limited effect ranges and high platform speeds.
Southern Environmental Law Center / Wannamaker, Catherine M.	NGO-017.31	Marine Mammal	Sonar	DEIS does not explain how Level A harassments will occur and if they are preventable.	Refer to Subchapter 4.3.7 for explanation of the acoustic affect analysis modeling. Mitigation is designed to avoid Level A takes - see revised Chapter 6.

Name/Agency	Letter Number	Comment Category	Comment Subcategory	Comments	Response
Southern Environmental Law Center / Wannamaker, Catherine M.	NGO-017.32	Marine Mammal	Sonar	DEIS does not explain how 50,000 dolphin Level B harassments will not impact annual rates of recruitment or survival. Does not discuss avoidance behavior and possibility of permanent displacement.	Level B harassments are defined as disturbances that are expected to temporarily disrupt behavior, and are not anticipated to impact population recruitment or survival. Further, the estimate presented in Subchapter 4.3 is likely an over estimation since the mitigation measures (refer to Chapter 6) will likely reduce this number significantly. Prior to training on the range, the Navy will obtain a letter of authorization (LOA) for effects to marine mammals. NMFS will consider population effects from all activities in their issuance of a LOA.
Southern Environmental Law Center / Wannamaker, Catherine M.	NGO-017.6	Marine Mammal	Sonar	DEIS fails to assess impacts of USWTR on marine mammals from ship strikes, entanglements and sonar.	Please refer to Subchapters 4.2.4 for information on ship strikes and entanglements. See Subchapters 4.3.8, 4.3.9 for information on the impacts of sonar.

Name/Agency	Letter Number	Comment Category	Comment Subcategory	Comments	Response
Sierra Club Florida / Bremer, Linda M.	NGO-021.3	Marine Mammal	Sonar	Supports FFWCC suggestion to research in changes in behavior of marine mammals exposed to sonar.	Navy will be implementing a program that would monitor potential effects to marine mammals and will provide a means of assessing mitigation effectiveness. The Navy supports a number of research efforts that are investigating potential effects of sonar on marine mammals. Please refer to Subchapter 6.1.3 in the EIS. The Navy supports a number of research efforts that are investigating potential effects of sonar on marine mammals. During 2004-2008, DoN provided over $94 million to support marine research, and has budgeted $22 million for 2009. This research will improve detection and monitoring of marine species, and further evaluate the effect of sound on marine life.
PenderWatch & Conservancy / Anonymous	NGO-024.2	Marine Mammal	Sonar	Sound in water behaves differently than in air. Marine mammals use vocal communication that could be damaged.	Please refer to Appendix C - Subchapter C.4.1.2, water medium is considered in the model. The acoustic modeling system was developed in consultation with NMFS and represents the best available and most applicable science of underwater acoustics.
Citizens Opposing Active Sonar Threats (COAST) / Wray, Russell	NGO-025.101	Marine Mammal	Sonar	DEIS suggestion that deaths due to sonar are limited to beaked whales are not true.	No marine mammal mortalities are anticipated due to sonar use on USWTR. Please refer to Subchapters 4.3.8 and 4.3.9.

Name/Agency	Letter Number	Comment Category	Comment Subcategory	Comments	Response
Citizens Opposing Active Sonar Threats (COAST) / Wray, Russell	NGO-025.33	Marine Mammal	Sonar	DEIS doesn't adequately consider stress of USWTR activities on ESA-listed whales, and how it may impact recovery.	Please refer the stress response discussion in Subchapter 4.3.1.3.3. The Navy is consulting with NMFS in accordance with Section 7 under ESA.
Citizens Opposing Active Sonar Threats (COAST) / Wray, Russell	NGO-025.39	Marine Mammal	Sonar	If a local population were to remain in USWTR range, it would be exposed to chronic stress.	Please refer to Subchapter 4.3.1. Risk function accounts for behavioral effects of stress. In February 2009, the Navy began implementing a program that is monitoring potential effects to marine mammals at the Jacksonville USWTR site.
Citizens Opposing Active Sonar Threats (COAST) / Wray, Russell	NGO-025.43	Marine Mammal	Sonar	DEIS overstates debate on potential non-auditory injury. In vivo bubble growth is ultimately caused by sonar.	Please refer to Subchapter 4.3.1.3.2.1. NOAA has found that frequencies at which resonance (leading to bubble-growth) is predicted to occur are below the frequencies utilized by the sonar systems employed in USWTR.
Citizens Opposing Active Sonar Threats (COAST) / Wray, Russell	NGO-025.48	Marine Mammal	Sonar	Fernandez et al. 2005: most beaked whales exposed to sonar likely died from decompression sickness.	This source has been acknowledged in the EIS. The Navy used the best available scientific data including all relative published peer-reviewed material.
Citizens Opposing Active Sonar Threats (COAST) / Wray, Russell	NGO-025.51	Marine Mammal	Sonar	Counter to DEIS: 2000 Bahamas incident resulted in abandonment of habitat by a resident population.	The NMFS and DoN joint report of the incident (December, 2001) did not indicate of abandonment of the habitat or additional mortality as a result of the sonar use.

Name/Agency	Letter Number	Comment Category	Comment Subcategory	Comments	Response
Natural Resources Defense Council (NRDC)	NGO-026.1	Marine Mammal	Sonar	DEIS ignores literature on behavioral impacts of sonar.	The EIS represents the best available and most applicable science, including all relative published peer-reviewed material.
Natural Resources Defense Council (NRDC)	NGO-026.11	Marine Mammal	Sonar	Mass strandings are likely only a fraction of the effects on marine mammal populations.	Comment noted.
Natural Resources Defense Council (NRDC)	NGO-026.15	Marine Mammal	Sonar	The proposed SQS-53 and SQS-56 systems have been linked to previous mass mortalities at intensity levels millions of times over the level the Bahamas 2000 whales were exposed to.	Oceanographic features that were present for this stranding event are not present at the USWTR. The criteria to analyze the effects of sonar were developed by NMFS. The Navy and NMFS, in the role as regulator and as a cooperating agency, developed the risk function for USWTR sonar use, for analysis of impacts using the best available and most applicable science.
Natural Resources Defense Council (NRDC)	NGO-026.48	Marine Mammal	Sonar	Sonar can disrupt social behavior, including mother-calf interaction, call rates, and changes in resting and orientation.	See discussion of analytical framework in Subchapter 4.3.1. The Navy has mitigation measures in place specific to operations conducted within the right whale critical habitat off the GA/FL coasts that include posting additional lookouts, reducing speed and minimizing time spent in this area. Actual training on the range will occur further offshore than the coastal habitat preferred by mother-calf pairs.

Name/Agency	Letter Number	Comment Category	Comment Subcategory	Comments	Response
Natural Resources Defense Council (NRDC)	NGO-026.55	Marine Mammal	Sonar	Impact to marine mammal species is foreseeable and should be given a greater degree of precaution.	The Navy is committed to reviewing and incorporating the best available information available to compile the environmental baseline (see Subchapters 3.2 and 3.3 re marine mammals) and conduct the environmental analyses (Subchapters 4.2 and 4.3). Prior to training on the range, the Navy will obtain a letter of authorization (LOA) for effects to marine mammals.
Natural Resources Defense Council (NRDC)	NGO-026.64	Marine Mammal	Sonar	Beaked whales are particularly vulnerable to sonar. A 2000 review by the Smithsonian finds that all mass strandings occurred with naval activity in the area.	Cuvier's beaked whales (*Ziphius cavirostris*) are the most frequently reported beaked whale to strand, with at least 19 stranding events from 1804 through 2000 (DoC and DON, 2001; Smithsonian Institution, 2000). Therefore, all beaked whale mass strandings have not been linked to sonar since some have occurred prior to the invention of sonar.

Name/Agency	Letter Number	Comment Category	Comment Subcategory	Comments	Response
Natural Resources Defense Council (NRDC)	NGO-026.69	Marine Mammal	Sonar	DEIS conclusions that sonar is not likely to injure marine mammals ignores numerous peer-reviewed papers.	Many of the references listed were consulted and cited. The references not included were mainly unpublished, unrefereed sources. Though the Frantzis 2004 conference proceeding is not cited, the incident in that paper (1996 Greece Beaked Whale Mass Stranding) is discussed in Appendix E. The latter paper by Martin et al. suggests a link between military exercises and whale strandings in the Canary Islands prior to 2002, but provides no specific information on temporal or spatial relationships and the types of exercises being conducted; it is speculative. There were two peer reviewed articles not cited in the EIS. (1) Wang et al. speculates about associations with Naval sonar but was unable to specify a spatial and temporal link between either U.S. or Chinese naval activities. (2) The Van Bree & Kristensen article was not used because of the non-verification of information regarding the stranding (i.e. unsure of the exercises conducted, no necropsy, no verifiable information on ships involved and locations), it is also speculative.

Name/Agency	Letter Number	Comment Category	Comment Subcategory	Comments	Response
Natural Resources Defense Council (NRDC)	NGO-026.7	Marine Mammal	Sonar	Sonar is known to cause mortality, panic responses, displacement, and behavior disruption in whales.	These responses are discussed in Subchapter 4.3.1. Based upon results of analyses conducted by the Navy (and coordinated with NMFS), marine mammal mortalities are not expected (see Subchapter 4.3). Please refer to Subchapter 4.3.3 for discussion of the conceptual framework. The risk function was developed, in consultation with NMFS, to account for potential responses down to 120 dB. The Navy continues to fund research to evaluate the causal mechanisms of marine mammal strandings.
Natural Resources Defense Council (NRDC)	NGO-026.8	Marine Mammal	Sonar	DEIS ignores nearly all literature of behavioral impacts, supporting instead a stand that contradicts evidence of harm.	The EIS represents the best available and most applicable science. The risk-function model (which includes behavior responses) was developed in coordination with NMFS. Exposure numbers do not equate to harm, harm is unlikely according to the risk-function results in Subchapters 4.3.8 and 4.3.9.

Name/Agency	Letter Number	Comment Category	Comment Subcategory	Comments	Response
Caruso, William	P-003.1	Marine Mammal	Sonar	Concern for effects of active sonar on whale calving in FL-GA bight.	The Navy has mitigation measures in place specific to operations conducted within the right whale critical habitat off the GA/FL coasts that include posting additional lookouts, reducing speed and minimizing time spent in this area. Actual training on the range will occur further offshore than the coastal habitat preferred by mother-calf pairs. The Navy is consulting with NMFS in accordance with Section 7 under ESA. Prior to training on the range, the Navy will obtain a letter of authorization (LOA) for effects to marine mammals.
Carey, Doris	P-004.1	Marine Mammal	Sonar	USWTR sites must be away from migratory areas, or areas with high concentrations of sonar-sensitive marine life.	Comment noted.
Anonymous	P-007.2	Marine Mammal	Sonar	Concern for impact on whales.	Comment noted. Please see Subchapter 4.3 for a discussion on the acoustics criteria and regulatory framework and an assessment of the potential effects from sonar. Refer to Chapter 6 for mitigation measures to reduce potential impacts.
Dereszynski, Nyla	P-010.3	Marine Mammal	Sonar	Does not believe the Navy will not use sonar when marine mammals are present.	Comment noted. Please refer to Chapter 6 for mitigation measures to reduce potential impacts from sonar. These are measures the Navy suggests, if they are included in the Record of Decision, they will become legally binding.

Name/Agency	Letter Number	Comment Category	Comment Subcategory	Comments	Response
Rigney, Dianne	P-013.1	Marine Mammal	Sonar	Opposes use of sonar, as it can damage marine mammals.	Comment noted. Please refer to Subchapter 4.3 for a discussion on the acoustics criteria and regulatory framework and an assessment of the potential effects from sonar. Refer to Chapter 6 for mitigation measures to reduce potential impacts.
Martin, Alison	P-014.3	Marine Mammal	Sonar	The effects of sonar on marine mammals are unknown due to a dearth of available data.	The Navy coordinated with NMFS. The best available and most applicable science was used in the preparation of the EIS. In February 2009, the Navy began implementing a program that is monitoring potential effects to marine mammals at the Jacksonville USWTR site. Through the Navy's marine mammal monitoring program, we will be able to establish baseline occurrence information. The Navy will be implementing mitigation measures as stated in Chapter 6.
Martin, Alison	P-014.5	Marine Mammal	Sonar	With respect to acoustic impacts, Past research studies have inconclusive results due to difficulties controlling environmental exposures.	Comment noted. The EIS is based on the best available and most applicable science.

Name/Agency	Letter Number	Comment Category	Comment Subcategory	Comments	Response
Berkman, Budd	P-017.1	Marine Mammal	Sonar	Strongly urges the Navy to think about this project carefully. The are many marine mammals in the waters that could be impacted as a result of the training.	The Navy will be implementing mitigation measures as stated in Chapter 6. The Navy will be implementing a monitoring program that would monitor potential effects to marine mammals at the Jacksonville USWTR site beginning in February 2009. Through the Navy's marine mammal monitoring program, we will be able to establish baseline occurrence information.
Center, Larry Carter	P-028.2	Marine Mammal	Sonar	Concern about effect of sonar on marine mammals.	Comment noted. Please refer to Subchapter 4.3 for analysis of acoustic impacts, and Chapter 6 for mitigation measures aimed at reducing potential impacts.
Sheilds, Brenda	P-029.1	Marine Mammal	Sonar	Opposes use of sonar in Florida waters unless research shows that marine life will not be harmed.	Comment noted. Please refer to Subchapter 4.3 for analysis of acoustic impacts, and Chapter 6 for mitigation measures aimed at reducing potential impacts.
Anonymous	P-031.2	Marine Mammal	Sonar	Charleston alternative has an abundance of marine mammals and sea turtles that would be impacted by sonar.	Please refer to Subchapter 4.3 for analysis of acoustic impacts to marine mammals, and Chapter 6 for mitigation measures aimed at minimizing those impacts. Refer to Chapter 3.3.2.3 for explanation that no adverse impacts to sea turtle are expected from sonar. The Navy is coordinating with NMFS under ESA and MMPA regarding potential impacts to marine mammals and turtles.

Name/Agency	Letter Number	Comment Category	Comment Subcategory	Comments	Response
Booher, Sam	P-040.6	Marine Mammal	Sonar	The NRDC has previously sued the Navy due to endangering marine mammals through use of sonar.	Comment noted. Please refer to Subchapter 4.3 for analysis of acoustic impacts, and Chapter 6 for mitigation measures aimed at reducing potential impacts.
Anonymous	P-045.2	Marine Mammal	Sonar	Concern for USWTR impacts on whales.	The Navy will be implementing mitigation measures as stated in Chapter 6. The Navy will be implementing a monitoring program that would monitor potential effects to marine mammals at the Jacksonville USWTR site beginning in February 2009. Through the Navy's marine mammal monitoring program, we will be able to establish baseline occurrence information.
Guan, Annie	P-052.1	Marine Mammal	Sonar	Mid-frequency sonar travels for as much as hundreds of miles, and can be lethal, which is unacceptable in endangered right whale habitat.	Please refer to Subchapter 4.3 for a discussion on the acoustics criteria and regulatory framework and an assessment of the potential effects from sonar. In particular, refer to the new Range Distance Table (Table 4.3-1) in Subchapter 4.3.3.1.
Shields, Brenda	P-060.3	Marine Mammal	Sonar	Concern for marine mammals, right whales in particular.	Comment noted.
Bonner, Teresa	P-065.2	Marine Mammal	Sonar	Sonar injures mammals not only by acoustic harassment, but by panic-induced rapid diving or surfacing.	It is unlikely that whales get "the bends," as explained in Subchapter 4.3.1.3.2.2. The issue raised and other potential hypotheses with regards to causes of marine mammal strandings, remain highly speculative.

Name/Agency	Letter Number	Comment Category	Comment Subcategory	Comments	Response
ten Hulzen, Kalinke	P-072.1	Marine Mammal	Sonar	Navy fails to analyze the impact of sonar on marine life, including the right whale.	Please refer to Subchapter 4.3 for detailed discussion of the predicted impact of sonar on marine life.
Alsentzer, Dorothée A.	P-083.3	Marine Mammal	Sonar	Concern for risks to marine mammals, including urging of adoption of mitigation measures.	No marine mammal mortalities are predicted from analyses (see Chapter 4). Please refer to Chapter 6 for discussion of the additional mitigation measures implemented to minimize impacts to marine mammals.
Cetacean Society International / Rossiter, William	NGO-014.5	Marine Mammal	Strandings	Sonar use concurrent with June 2008 stranding in Cornwall, England was initially denied, but a FOI showed it was concurrent with naval activity. Data could have been collected if qualified observers had been alerted prior to exercise.	Comment noted. All sonar events that Third party lookouts not as qualified or as practical as Navy lookouts (see Subchapter 6.6). Navy trains all lookouts to be objective.
NY Whale and Dolphin Action League / Williams, Taffy	NGO-018.7	Marine Mammal	Strandings	Concern for physiological impacts of sonar on marine mammals, and of sonar as a cause of beachings.	Concern for physiological impacts of sonar on marine mammals and of sonar as a cause of beachings are addressed in Chapter 4 and Appendix E.

Name/Agency	Letter Number	Comment Category	Comment Subcategory	Comments	Response
Earthjustice / Renshaw, Katie	NGO-019.24	Marine Mammal	Strandings	Stranding and physiological harm of whales (receiving far below PTS sound levels) increases the number of likely fatalities due to sonar. This must be considered in analysis of impact on marine mammals.	No mortalities are anticipated due to sonar. The analytical methodology used in this EIS/OEIS was developed in close coordination with NMFS. This represents the best available and most applicable science with regard to analysis of effects to marine mammals from MFA/HFA sound sources. While recognizing there is incomplete and unavailable information with regard to behavioral impacts on marine mammals, the risk function curve extends to 120 dB SPL specifically to encompass uncertainty and the potential for behavioral reactions in marine mammal species that may be affected by sounds perceived at levels just above ambient in some areas during some parts of the year in east coast.
Citizens Opposing Active Sonar Threats (COAST) / Wray, Russell	NGO-025.100	Marine Mammal	Strandings	Minke whales were involved in 2005 NC beaching, and exhibited unusual behavior in 2003 Haro Strait incident. [contrary to ICES 2005a,b references]	The NMFS (2005) Haro report acknowledges that a Minke whale was observed porpoising, but no Minke whales were observed stranded. As discussed in Appendix E, the Minke whale necropsied in the NC stranding showed no physical damage associated with sonar and its stranding was concluded to likely be coincidental with the other whales (Hohn et al., 2006). The cause of NC stranding event is unknown (Hohn et al., 2006). The cause of the 2003 Haro Strait incident is also unknown (NMFS, 2005).

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Citizens Opposing Active Sonar Threats (COAST) / Wray, Russell	NGO-025.102	Marine Mammal	Strandings	D-18 statement about returning animals (Bahamas 2000) to sea does not mean they didn't die.	There were no reports of any whales re-stranding or found dead at sea.
Citizens Opposing Active Sonar Threats (COAST) / Wray, Russell	NGO-025.103	Marine Mammal	Strandings	Madeira, 2000 (D-19) discussion does not mention that a fourth whale was found floating dead by fishermen.	The fourth whale did not come ashore, therefore no necropsy was performed to determine the cause of death (Ketten, 2005). As such, it was not included in the stranding report (Appendix E).
Citizens Opposing Active Sonar Threats (COAST) / Wray, Russell	NGO-025.104	Marine Mammal	Strandings	Canary Islands, 2002 (D-20) discussion does not mention four beaked whales found floating dead over next 4 days after event.	This is mentioned in the '2002 Canary Islands Beaked Whale Mass Stranding (24 September)' section of Appendix E.
Citizens Opposing Active Sonar Threats (COAST) / Wray, Russell	NGO-025.105	Marine Mammal	Strandings	Spain, 2006 (D-22) whales were necropsied, and showed similar effects seen in bodies of whales necropsied in Bahamas 2000 and Canary Islands 2002, though results have not been published.	Comment noted.
Citizens Opposing Active Sonar Threats (COAST) / Wray, Russell	NGO-025.106	Marine Mammal	Strandings	Assumption that marine mammals strand immediately (D-24) is unsupported. Animals may become disoriented and not strand or die for a period of time.	There is no scientific literature to support this claim. The strandings that have been associated with sonar occurred over a relatively short time period after the sonar event.

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Citizens Opposing Active Sonar Threats (COAST) / Wray, Russell	NGO-025.107	Marine Mammal	Strandings	Marine mammals may migrate, or be carried by currents, to strand at a location removed from sonar use.	There is no scientific literature to support this, strandings that have been associated with sonar occurred over a relatively short time period after the sonar event.
Citizens Opposing Active Sonar Threats (COAST) / Wray, Russell	NGO-025.108	Marine Mammal	Strandings	Haro Strait, 2003 - USS Shoup was also in the area on Apr 23-24 (in addition to acknowledged May 5 activity). Strandings may have resulted from earlier sonar exposure.	Data on the Haro Strait presented in the EIS has been taken from the final report prepared by NMFS available at: http://www.nmfs.noaa.gov/pr/pdfs/acoustics/assessment.pdf. The NMFS evaluation of the event did not identify any potential impacts that could have occurred prior to May 5.
Citizens Opposing Active Sonar Threats (COAST) / Wray, Russell	NGO-025.109	Marine Mammal	Strandings	Haro Strait, 2003 - DEIS should include observed behavior of J-Pod orcas, Dall's porpoises, and Minke whale.	There is significant ambiguity regarding the behavior and responses of 'J' pod killer whales prior to the point of closest approach of the USS Shoup. NMFS (2005) reports a Minke whale porpoising, but it did not come ashore. There is also significant discrepancy among scientists who have viewed the video images of the animals during the point of closest approach. The Navy has reviewed a number of documents related to the 2003 Haro Straight (NMFS, 2005; ICES 2005a,b) and provided appropriate information related to stranding to Appendix E.

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Citizens Opposing Active Sonar Threats (COAST) / Wray, Russell	NGO-025.11	Marine Mammal	Strandings	Preliminary report of Jan 2005 stranding in NC indicates physical injuries from sonar.	Please refer to Appendix E.4.2 (and Hohn et al., 2006). Necropsies from the stranding event revealed no physical damage commonly associated with sonar.
Citizens Opposing Active Sonar Threats (COAST) / Wray, Russell	NGO-025.110	Marine Mammal	Strandings	Statement that no other stranding event associated with ASW in Hawaiian islands (D-27) is not true, as April 2007 exercises associated with stranding of a pygmy sperm whale on Lanai and Maui.	There is no evidence to support this claim.
Citizens Opposing Active Sonar Threats (COAST) / Wray, Russell	NGO-025.111	Marine Mammal	Strandings	DEIS evaluation of Hanalei Bay, 2004 as a casual link are not justified by the evidence.	Data presented in this EIS on Hanalei Bay have been taken from the final report prepared by NMFS for this incident.
Citizens Opposing Active Sonar Threats (COAST) / Wray, Russell	NGO-025.112	Marine Mammal	Strandings	Discussion of Japan, 1980-2004 (D-28) does not detail specific Navy activity types, and ignores that strandings may not occur immediately after exposure.	There is no evidence to support that Navy actives resulted in any strandings. Strandings that have been associated with sonar occurred over a relatively short time period after the sonar event.
Citizens Opposing Active Sonar Threats (COAST) / Wray, Russell	NGO-025.113	Marine Mammal	Strandings	Statement that none of animals stranded in NC, 2005 exhibited trauma similar to MFA sonar (D-31) is untrue, as NMFS preliminary investigation showed indicative injuries, including air bubbles in liver.	Data presented in this EIS have been taken from the final report prepared by NMFS for this incident.

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Citizens Opposing Active Sonar Threats (COAST) / Wray, Russell	NGO-025.114	Marine Mammal	Strandings	Contrary to D-31: Whale flight responses could persist for many hours if sonar caused panic.	There is no scientific evidence to support this claim.
Citizens Opposing Active Sonar Threats (COAST) / Wray, Russell	NGO-025.115	Marine Mammal	Strandings	Figure D-4 does nothing to make weather a more plausible explanation of stranding.	Figure E-3 shows that there was a significant weather event; weather events have been shown to cause strandings.
Citizens Opposing Active Sonar Threats (COAST) / Wray, Russell	NGO-025.116	Marine Mammal	Strandings	[List of other stranding events not discussed in DEIS]	Please refer to the revised Appendix E. Marine mammals strand for a number of reasons as discussed in Appendix E Unusual mortality events reasonably associated in time and space with naval activities are discussed in Appendix E.
Citizens Opposing Active Sonar Threats (COAST) / Wray, Russell	NGO-025.117	Marine Mammal	Strandings	Mixed-species mass-strandings used to be rare. All mixed-species mass-strandings (as of 2000) have been associated with naval activity (presentation at IWC 2000 workshop).	These statements are inaccurate. It is mass strandings of beaked whales involving more than one species that are uncommon. All events associated with naval activity have been discussed in the EIS in Appendix E.
Citizens Opposing Active Sonar Threats (COAST) / Wray, Russell	NGO-025.118	Marine Mammal	Strandings	Friedman 1989: Mass strandings of Cuvier's beaked whales were extremely rare before 1960s (when sonar use became common).	Prior to the Marine Mammal Health and Stranding Response Act (1992), there was inconsistency in response and reporting of stranding events, leading to difficulty in interpreting long-term trends in marine mammal stranding. Please refer to Appendix E, Subchapter E.2.

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Citizens Opposing Active Sonar Threats (COAST) / Wray, Russell	NGO-025.119	Marine Mammal	Strandings	Likely that only a fraction of strandings are carefully and transparently investigated (limitations of resources and political pressures).	No evidence is presented to support this claim.
Citizens Opposing Active Sonar Threats (COAST) / Wray, Russell	NGO-025.34	Marine Mammal	Strandings	Pygmy and dwarf sperm whales have been involved in stranding due to naval sonar, and therefore would be impacted due to USWTR (more so due to detection difficulty).	Other explanations have been concluded to have caused the 2005 NC stranding event. Please refer to Appendix E.4.2. No pygmy or dwarf sperm whale takes are predicted (see Subchapter 4.3). Mitigation measures (refer to Chapter 6) including passive sonar and aerial surveys compliment observers to further decrease likelihood of whale takes.
Citizens Opposing Active Sonar Threats (COAST) / Wray, Russell	NGO-025.37	Marine Mammal	Strandings	Balcomb and Claridge 2001: Beaked whales involved in Bahamas stranding abandoned the area or were killed.	Comment noted. Reverberations such as those that occurred in the 2000 Bahamas stranding event are not likely to occur in the USWTR Range due to different bathymetric features.
Citizens Opposing Active Sonar Threats (COAST) / Wray, Russell	NGO-025.40	Marine Mammal	Strandings	[Vs. p.4.3-92] Stranding requires only sonar and presence of whales. Surface ducts, steep bathymetry and constricted channels may contribute but are not required.	Oceanographic features that were present for stranding event are not present at the USWTR. Stranding occurred prior to use of sonar. Refer to Appendix E.
Citizens Opposing Active Sonar Threats (COAST) / Wray, Russell	NGO-025.41	Marine Mammal	Strandings	Not all fatalities result in beaching. What percent of sonar-related fatalities are beachings?	No evidence exists of direct mortality from sonar.

Name/Agency	Letter Number	Comment Category	Comment Subcategory	Comments	Response
Citizens Opposing Active Sonar Threats (COAST) / Wray, Russell	NGO-025.45	Marine Mammal	Strandings	[Lists a number of stranding events not mentioned in DEIS.]	Marine mammals strand for a number of reasons. Appendix E discusses unusual mortality events reasonably associated in time and space with naval activities.
Citizens Opposing Active Sonar Threats (COAST) / Wray, Russell	NGO-025.46	Marine Mammal	Strandings	Friedman 1989: Strandings were rare before sonar deployment in 1960s.	As populations of people increase near the shore, beachings are better recorded.
Citizens Opposing Active Sonar Threats (COAST) / Wray, Russell	NGO-025.47	Marine Mammal	Strandings	Many strandings likely are not detected due to remoteness of locale.	Comment noted.
Citizens Opposing Active Sonar Threats (COAST) / Wray, Russell	NGO-025.49	Marine Mammal	Strandings	Given that many marine mammal deaths likely occur at sea, they are not detected, significant impacts may occur before changes in stocks are detected.	Comment noted. There is no evidence to support this claim. No mortalities are anticipated due to sonar use at USWTR.

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Citizens Opposing Active Sonar Threats (COAST) / Wray, Russell	NGO-025.8	Marine Mammal	Strandings	Hildebrand and Balcomb (2004) report 2000 Bahamas mass stranding was due to sonar at 140 dB, significantly less than DEIS' Level A threshold.	Sonar levels during the Bahamas marine mammal mass stranding are in the same range as USWTR levels (the average source levels of pings varied from 223-235 dB). The Bahamas stranding event had unique contributory factors, including unusual underwater bathymetry, intensive use of multiple sonar units, and limited egress. Refer to Appendix E for additional details. Safety zones will be applied beginning at 3,000 feet, which is greater than the typical range to potentially cause a temporary or permanent threshold shift. Active sonar transmissions would cease if a marine mammal was detected within 600 feet.
Citizens Opposing Active Sonar Threats (COAST) / Wray, Russell	NGO-025.96	Marine Mammal	Strandings	D.5 statement of sonar being "potentially" associated with stranding is misleading.	Please refer to revised text in Appendix E.
Citizens Opposing Active Sonar Threats (COAST) / Wray, Russell	NGO-025.97	Marine Mammal	Strandings	D-19 wording is confusing, does not specifically mention two Minke whales.	Please refer to revised text in Appendix E.

Name/Agency	Letter Number	Comment Category	Comment Subcategory	Comments	Response
Citizens Opposing Active Sonar Threats (COAST) / Wray, Russell	NGO-025.98	Marine Mammal	Strandings	DEIS (D-19) conclusion that dolphin stranding (Bahamas 2000) unrelated to sonar is unlikely.	The NOAA/Navy stranding report concluded that the dolphin stranding was not associated with the sonar activity. The location of the dolphin was on the opposite side of Abaco Island and could not have swam or drifted to that location.
Citizens Opposing Active Sonar Threats (COAST) / Wray, Russell	NGO-025.99	Marine Mammal	Strandings	(D-19) suggestion that disease could be cause of spotted dolphin stranding is unlikely. Diseased animals may be more susceptible to sonar.	The NOAA/Navy stranding report concluded that the dolphin stranding was not associated with the sonar activity. The location of the dolphin was on the opposite side of Abaco Island and could not have swam or drifted to that location.
Natural Resources Defense Council (NRDC)	NGO-026.62	Marine Mammal	Strandings	DEIS glosses over many pertinent recent peer-reviewed papers and IWC reports on strandings.	Please refer to the revised Appendix E. The Navy discusses in detail causes for marine mammal strandings and analyzes mass stranding events associated in time and space with military activities. This section is well cited so that the reader can review the articles and peer-reviewed literature in greater detail if motivated.
Natural Resources Defense Council (NRDC)	NGO-026.63	Marine Mammal	Strandings	DEIS only discusses some of the recent stranding events.	Please refer to the revised Appendix E. Marine mammals strand for a number of reasons as discussed in Appendix E. Unusual mortality events reasonably associated in time and space with naval activities are discussed in Appendix E.
Natural Resources Defense Council (NRDC)	NGO-026.65	Marine Mammal	Strandings	It is not certain that some beaked whale strand naturally.	Cuvier's beaked whales (*Ziphius cavirostris*) are the most frequently reported beaked whale to strand, with at least 19 stranding events from 1804 through 2000 (DoC and DON, 2001; Smithsonian Institution, 2000).

Name/Agency	Letter Number	Comment Category	Comment Subcategory	Comments	Response
Natural Resources Defense Council (NRDC)	NGO-026.66	Marine Mammal	Strandings	Proper documentation of whale stranding is impossible due to remote locations and limited resources.	Comment noted.
Natural Resources Defense Council (NRDC)	NGO-026.67	Marine Mammal	Strandings	Many whale mortalities due to sonar occur at sea, and are never recorded.	No evidence is presented to support this claim.
Natural Resources Defense Council (NRDC)	NGO-026.68	Marine Mammal	Strandings	Stranded whales exhibit 'the bends', likely due to surfacing or diving rapidly when exposed to sonar.	It is unlikely that whales get "the bends," as explained in Subchapter 4.3.1.3.2.2. The issue raised and other potential hypotheses with regards to causes of marine mammal strandings, remain highly speculative.
Martin, Alison	P-014.6	Marine Mammal	Strandings	Although the DEIS does indicates that several mass strandings were the results of man-made underwater acoustics, the NRDC indicates on their website that the strandings are only a fraction of the real environmental damage. As such, additional study on acoustic impacts to marine life are warranted.	Please refer to the discussion in Appendix E and 6.6.1.3 on stranding event case studies. The Navy will be implementing mitigation measures as stated in Chapter 6. The Navy will be implementing a monitoring program that would monitor potential effects to marine mammals at the Jacksonville USWTR site beginning in February 2009. Through the Navy's marine mammal monitoring program, we will be able to establish baseline occurrence information.

Name/Agency	Letter Number	Comment Category	Comment Subcategory	Comments	Response
Capozzelli, J.	P-016.2	Marine Mammal	Strandings	A few years ago, 37 whales beached themselves in the proposed project area due to naval sonar activity, and the proposed USWTR would test in the same area.	Please refer to the discussion about the North Carolina stranding in Appendix E.
Capozzelli, J.	P-016.3	Marine Mammal	Strandings	Beached whales have been found with bleeding around the brains and eyes due to sonar. Other harmful effects include: avoidance and displacement from habitats, permanent tissue damage, temporary hearing loss. Also a growing body of scientific evidence shows that sonar can kill marine mammals by causing their organs to rupture.	Please refer to the discussion in Appendix E on stranding event case studies and to the discussion on biological effects from sonar in Subchapter 4.3.1. Additionally, there is no science to support the claim that sonar can cause organs to rupture. The Navy will implement mitigation measures to minimize impacts to marine mammals from active sonar.
Capozzelli, J.	P-016.4	Marine Mammal	Strandings	The implementation of the project would result in the impact to marine mammals, as past stranding events in the Bahamas, Canary Islands, and Japan have coincided with military sonar usage. Also, according to the International Whaling Commission, there is overwhelming evidence linking military sonar to whale strandings. The Navy must show regard for environmental impacts from sonar usage.	Please refer to the discussion in Appendix E on stranding event case studies. The Navy will be implementing mitigation measures as stated in Chapter 6. The Navy began a marine mammal monitoring program within the Jacksonville OPAREA beginning in February 2009 to establish baseline occurrence information. The Navy has consulted with NMFS and will implement required mitigation measures, under ESA and MMPA.

Name/Agency	Letter Number	Comment Category	Comment Subcategory	Comments	Response
Shields, Brenda	P-029.2	Marine Mammal	Strandings	There are many recent incidences where sonar has been blamed in cetacean beaching in North Carolina, California, Bahamas, Canary Islands, and Hawaii	Please refer to the discussion in Appendix E on stranding event case studies.
FL Fish and Wildlife Conservation Commission (FFWCC) / Poole, Mary Ann	S-021.4	Marine Mammal	Strandings	During the project activities, should there be any cetacean stranding that are temporally and spatially coincident with Navy training events, the activity should cease and the Navy should fund a thorough investigation to determine the cause of the strandings. Activities should not resume until the identified cause can be appropriately addressed.	The Navy has developed their stranding response plan in coordination with the National Marine Fisheries Service, a cooperating agency on the EIS.
Department of the Interior (DOI) / Hogue, Gregory	F-001.1	Miscellaneous		DOI has reviewed the DEIS, and has no comments at this time. Further contact can be made at 404-331-4524 or gregory_hogue@ios.doi.gov.	Comment noted.
NASA / Campbell, John H.	F-002.1	Miscellaneous		USWTR would cause unacceptable impact to NASA's Wallops Flight Facility - VACAPES is heavily used by NASA flight operations, and regular airspace access is needed for NASA, DoD, and commercial activities.	The Navy will coordinate with NASA if Site D is selected.

Name/Agency	Letter Number	Comment Category	Comment Subcategory	Comments	Response
USEPA / Mueller, Heinz J.	F-005.5	Miscellaneous		Rate EIS as EC-2 [Environmental Concerns], and requests additional information.	Comment noted.
Jacksonville Chamber of Commerce / Haley, John	L-002.1	Miscellaneous		Jacksonville Chamber of Commerce supports the Navy's activity in Jacksonville.	Comment noted.
USACE Savannah Office / Kertis, Edward. J.	F-006.1	Miscellaneous		USWTR is outside the jurisdiction of the Savannah District USACE, therefore, no comment	Comment noted.
Citizens Opposing Active Sonar Threats (COAST)	NGO-001.1	Miscellaneous		Request for a copy of DEIS to be sent to COAST.	Copy of DEIS has been sent to the address provided.
PenderWatch & Conservancy / Spruill, John R.	NGO-004.2	Miscellaneous		The Navy should immediately post the transcripts of the public hearings (for both EISs) for the public.	Transcripts have been posted on the USWTR Web site.

Name/Agency	Letter Number	Comment Category	Comment Subcategory	Comments	Response
Ocean Conservancy / Cornish, Vicky	NGO-005.6	Miscellaneous		DEIS shows that a lot of environmental data still needs to be collected.	The EIS represents the best available and most applicable science at this time. Please refer to Chapter 1 - Purpose and Need.
Jacksonville Area Ship Repair Association / Froehlich, Ed	NGO-008.1	Miscellaneous		Jacksonville Area Ship Repair Association supports the Navy's activity in Jacksonville, including USWTR.	Comment noted.
Duke Environmental Law & Policy Clinic	NGO-012.46	Miscellaneous		Request including the Duke Environmental Law and Policy Clinic in further announcements and notices.	Comment noted. Duke has been added to the list of stakeholders.
Duke Environmental Law & Policy Clinic	NGO-012.6	Miscellaneous		Need for more data - inadvisable to proceed in the absence of understanding.	The EIS represents the best available and most applicable science. See Purpose and Need in Chapter 1.

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Natural Resources Defense Council (NRDC)	NGO-026.141	Miscellaneous		Navy has not released CASS/GRAB, or other modeling systems, to the public. Release to public is required under several laws.	The CASS/GRAB model is classified; however, a discussion of the CASS/GRAB model along with the Navy and SAIC marine mammal acoustic exposure models are publicly available in the Center for Independent Experts (CIE) Report of December 2008. The CIE report is currently available to the public on the NMFS website with a link at the bottom of the following web page http://www.nmfs.noaa.gov/pr/permits/incidental.htm#applications. See the following pages in the CIE report for a discussion of CASS/GRAB propagation model: 6, 19, 31, 38 and 79.
Natural Resources Defense Council (NRDC)	NGO-026.4	Miscellaneous		DEIS ignores comment letters from 2005 DEIS.	Comments previously submitted to the 2005 USWTR EIS were considered in the preparation of the 2008 EIS.
Natural Resources Defense Council (NRDC)	NGO-026.51	Miscellaneous		Many DoN 2007 reports by Geo-Marine are unavailable for review.	EFH, MRAs and the Nodes Report (prepared by GMI) are available on the USWTR public Web site (http://projects.earthtech.com/uswtr).
Natural Resources Defense Council (NRDC)	NGO-026.56	Miscellaneous		DEIS cites internal documents over primary literature sources.	MRAs and Node Reports are a synthesis of available scientific literature.

Name/Agency	Letter Number	Comment Category	Comment Subcategory	Comments	Response
PenderWatch & Conservancy / Spruill, John R.	NGO-027.1	Miscellaneous		Requests all scoping comment letters be released to the public (via posting on the web).	Scoping comment letters submitted for the EIS before the deadline are identified, discussed in Subchapter 7.2.1, and were posted to the USWTR public Web site.
PenderWatch & Conservancy / Spruill, John R.	NGO-027.2	Miscellaneous		EIS does not consider Coastal Habitat Protection Plan (CHPP - developed by NC DENR), which is applicable to any coastal project off NC. Requests FEIS follows CHPP.	CHPP applies to state agency projects submitted for review under NC Coastal Zone Management Act. Navy will submit a negative CCD for the states that would not be impacted by the selected alternative USWTR.
PenderWatch / Spruill, John R.	NGO-028.1	Miscellaneous		We have been very involved in reviewing and challenging plans for the offshore sonar training range, located just offshore here in Onslow Bight. The Navy only posted some of the response letters to AFAST. We have read every one of those letters and report to you that 95 percent of the letters expressed either direct opposition to the plans or expressed very strong concerns about the lack of thoroughness of that Draft Environmental Impact Statement.	Since the different documents concern different projects, with different purposes and needs, we are not able to categorically consider comments for one project on the other. However, in cases where comment letters have requested consideration on both projects, we have done so.

Name/Agency	Letter Number	Comment Category	Comment Subcategory	Comments	Response
PenderWatch / Spruill, John R.	NGO-028.4	Miscellaneous		The comments on the USWTR DEIS are equally applicable to the AFAST DEIS.	Since the different documents concern different projects, with different purposes and needs, we are not able to categorically consider comments for one project on the other. However, in cases where comment letters have requested consideration on both projects, we have done so.
PenderWatch / Spruill, John R.	NGO-028.6	Miscellaneous		Section 3.2.5 of the Impact Statement says that part of the process included going to Google looking for information. We suggest it would be more appropriate to walk down the hall land read all the comment letters that were submitted concerning the Training Range before the Navy spends time Googling. Thank you very much.	Primary literature, governmental publications, and other data sources such as search engines were used to obtain information for the EIS. When internet searches were warranted, the authors evaluated each result for credibility, and overall quality and relevance of the content.
Anonymous	P-006.1	Miscellaneous		Marine Mammal Acoustic Analysis report and EFH report not downloading from web site.	Comment noted and the links have been assessed.
Sellard, Sam	P-009.1	Miscellaneous		Can't locate information on USWTR site locations on the web site.	Description and figures of locations are available on the USWTR Web site and in the EIS.

Name/Agency	Letter Number	Comment Category	Comment Subcategory	Comments	Response
Pillmore, Patricia J.	P-019.1	Miscellaneous		Statement that the Navy continually requests comments from the public.	Public is afforded opportunities to comment in accordance with NEPA
Shields, Brenda	P-029.4	Miscellaneous		Newspaper notices did not mention sonar, therefore, much of the public does not realize that sonar is to be used.	Newspaper ad identified that the purpose of the project was for ASW which includes the use of sonar
Culler, William S.	P-033.1	Miscellaneous		Navy has done a thorough and professional job in studying the potential environmental impacts of USWTR.	Comment noted.
Culler, William S.	P-033.3	Miscellaneous		Asks media coverage to be even-handed, as opposed to previous one-sided reports.	Comment noted.
Nowlin, Michelle	P-035.1	Miscellaneous		Ask that Navy include comments on the 2005 DEIS in the administrative record.	All previous comments are part of the administrative record.

Name/Agency	Letter Number	Comment Category	Comment Subcategory	Comments	Response
Strong, Corwin	P-038.1	Miscellaneous		USWTR is a relatively minor threat to the marine environment versus boat traffic, recreational fishing, pollution. Media coverage must report this objectively.	Comment noted. Please refer to Subchapter 4.8 for analysis of cumulative impacts of all other activities in the USWTR study area.
Ryans, Susan	P-047.1	Miscellaneous		Supports for military need to train	Comment noted.
Van Saum, David	P-058.3	Miscellaneous		Different issues than with the sonar range off San Diego, as the environment and distribution patterns are completely different.	Comment noted.
Shields, Brenda	P-060.1	Miscellaneous		Notices to public don't mention use of sonar.	Newspaper ad identified that the purpose of the project was for ASW which includes the use of sonar.
Bonner, Teresa	P-065.1	Miscellaneous		Federal ruling stopped sonar testing off southern CA.	Comment noted. This ruling was later overturned by the Supreme Court.

Name/Agency	Letter Number	Comment Category	Comment Subcategory	Comments	Response
Alsentzer, Mary and Ulrich	P-066.1	Miscellaneous		Consider any comment for Cherry Point DEIS for USWTR, and vice-versa.	Since the two DEISs are different projects, with different purposes and needs, we are not able to categorically consider comments for one project on the other. However, in cases where comment letters have requested consideration on both projects, we have done so.
Alsentzer, Mary and Ulrich	P-066.2	Miscellaneous		Post all comment letters and hearing transcripts for both DEISs on web sites.	Transcripts have been posted on both the USWTR and Cherry Point Range Complex Web sites.
Moore, Gary D., P.H.G.	P-070.2	Miscellaneous		Asks to be included on any mailing list and requests a copy of the EIS.	A copy of the Draft OEIS/EIS has been sent.
Davis, Susan	P-076.4	Miscellaneous		USWTR would not have any beneficial environmental or economic impacts to NC.	Environmental and socioeconomic benefits and impacts for NC are addressed in Chapter 4.
Neal, Tyler	P-087.6	Miscellaneous		Believes public is generally unaware of USWTR, better advertising would have produced more public involvement.	Along with requisite publication in the Federal Register, the USWTR EIS and public hearings were advertised over multiple days in 25 public newspapers. A public Web site was established containing all pertinent information and documents on the project.

Name/Agency	Letter Number	Comment Category	Comment Subcategory	Comments	Response
McCarthy, Robin	P-091.1	Miscellaneous		Believes that the Navy has rushed the EIS without properly assessing the impact of sonar, implementing an adequate set of mitigation measures, or analysis of potential alternative sites.	The Navy does not concur with this statement. The EIS represents a thorough analysis, consulting 1400+ references and many experts. At all times, the Navy used the best available and most applicable science.
Bonilla-Jones, Carmen	P-100.1	Miscellaneous		Urges conservation of the environment and human interests over military development.	Comment noted. Please refer to Chapter 1 for explanation of the need for an instrumented range.
Hall, Gilbert	P-101.1	Miscellaneous		Sonar can be tested in alternate ways, but whales cannot be replaced.	Comment noted. Please refer to Chapter 1 for explanation of the need for an instrumented range and the inadequacy of simulations. Please refer to Chapters 4 & 6 for discussion of potential impacts to whales, and planned mitigation measures to limit potential impacts. No marine mammal mortality is predicted due to USWTR activities.
Vincent, Shirley	P-104.1	Miscellaneous		Believes that USWTR will be disruptive beyond the scope of the study.	The Navy does not concur with this statement. Further information is not provided by the submitter on what may be disrupted. The EIS represents the best available and most applicable science.

Name/Agency	Letter Number	Comment Category	Comment Subcategory	Comments	Response
South Carolina Department of Natural Resources / Perry, Robert D.	S-001.1	Miscellaneous		SCDNR submitted scoping comments on Oct 22, 2007 on the subjects of marine mammals, fish, fisheries management, and cumulative impacts; all of these subjects have been addressed.	Comment noted.
South Carolina Department of Natural Resources / Perry, Robert D.	S-001.2	Miscellaneous		SCDNR has reviewed the DEIS, and believes it sufficiently addresses the full range of potential impacts, and believes all its concerns have been addressed.	Comment noted.
North Carolina Division of Coastal Management (NCDCM) / Rynas, Stephen	S-003.1	Miscellaneous		As Cherry Point is no longer the preferred alternative, NCDCM is not affected, and has not submitted a full range of comments. Please continue to consider comments submitted Jan 24, 2006.	Comment noted. All previous comments have been considered during the writing of this OEIS/EIS.
NC State Clearinghouse Dept of Administration	S-004.1	Miscellaneous		Submitted a letter stating no comment	Comment noted.
NC Division of Environmental Health / Johnson, Kelly	S-019.1	Miscellaneous		No objection to USWTR if activities do not contaminate groundwater.	Please refer to Subchapter 4.6 - Landside impacts. Groundwater would not be contaminated during landfall construction and operation. Small quantities of standard maintenance and repair materials may be used, but will be properly disposed.

Name/Agency	Letter Number	Comment Category	Comment Subcategory	Comments	Response
FL Division of Historical Resources - Bureau of Historic Preservation / Edwards, S.	S-022.1	Miscellaneous		Letter received from agency indicating no comment on DEIS.	Comment noted.
GA Dept of Natural Resources (GADNR) / Holcomb, Noel	S-018.4	Miscellaneous		The Navy estimated the annual "Acoustic Footprint" and exposure levels in its Acoustic Effects Analysis, but did not present this information in the DEIS/OEIS. This information is needed to assess the environmental impacts of the project and should be included in the Final EIS.	Please refer to the new Table 4.3-1 (Range Distance Table). The maximum distance sonar energy will travel is 147 km (approximately 80 nautical miles), but levels at this distance from the source are not expected to cause harassments. As detailed in the referenced table, harassments are expected to drop substantially at distances greater than 43.8 km (approximately 24 nautical miles) from the source.
FL Department of Environmental Protection (FLDEP) / Griffin, Lynn (General)	S-020.13	Miscellaneous		Please explain the term deadman anchor.	A deadman anchor is an object fixed in the ground to anchor a line or cable. This definition has been added to Subchapter 2.5.
FL Department of Environmental Protection (FLDEP) / Griffin, Lynn (General)	S-020.16	Miscellaneous		Please provide the state with copies of the reference DoN 2007d (Marine Resource Assessment for the Charleston/Jacksonville Operating Area).	This reference is available on the USWTR web site at http://projects.earthtech.com/uswtr/USWTR_library/PDF_library/MRAs/MRA_CHASJAX.pdf.

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FL Department of Environmental Protection (FLDEP) / Griffin, Lynn (General)	S-020.29	Miscellaneous		Please provide tables detailing the impacts to resources.	Please refer to table ES-3 in the Executive Summary. In addition, please refer to table 4.8-5.
FL Fish and Wildlife Conservation Commission (FFWCC) / Poole, Mary Ann	S-021.27	Miscellaneous		Concern #7: The first paragraph on page 3.2-21 provides a citation to 'FFWCC, 2005c),' but the reference list does not contain a citation for 'FFWCC, 2005c.' Recommendation #7: Please describe and add the citation for '(FFWCC, 2005c)' to the reference list.	The reference discrepancy has been addressed in Chapter 8 of the FEIS. The citation now reads "(FFWCC, 2006, 2008b)." The references are to two FFWCC web sites: http://myfwc.com/marine/ar/arOverview.html and http://myfwc.com/marine/ar/index.asp.
Natural Resources Defense Council (NRDC)	NGO-026.81	Mitigation Measures	Fish	USWTR should avoid spawning and other important habitat for fish species, especially hearing specialists.	Please refer to the revised Subchapter 6.6 - Protection Measures Considered but Eliminated.
Marine Mammal Commission / Ragen, Timothy J.	F-004.4	Mitigation Measures	Marine Mammal	Modify 6.1.4 to include suspension of activities if a dead or injured marine mammal is detected and injuries could be connected to Navy activities. Consult with NMFS to consider steps that could prevent a similar incident.	The Navy has consulted with NMFS under Section 7 of ESA and will consult with NMFS and obtain an LOA under MMPA prior to commencement of training activities on the range. All required mitigation measures will be implemented.

Name/Agency	Letter Number	Comment Category	Comment Subcategory	Comments	Response
Marine Mammal Commission / Ragen, Timothy J.	F-004.6	Mitigation Measures	Marine Mammal	Probability of detection of marine mammals using current mitigation techniques is not 100%.	Please refer to the revised Subchapter 6.1.2.5.
Lynch & Eatman, LLP	NGO-003.4	Mitigation Measures	Marine Mammal	Mitigation measures have been successful in protecting marine mammals in other parts of the world, but the Navy refuses to adopt mitigation measures for Cherry Point.	Mitigation measures have been developed in full consideration of the recommendations of NMFS. See revised Chapter 6.
Ocean Conservancy / Cornish, Vicky	NGO-005.5	Mitigation Measures	Marine Mammal	Encourages mitigation of impacts, such as seasonal restriction of activities to avoid conflicts with right whales.	Please refer to the revised Chapter 6 for mitigation measures planned for USWTR. The Navy consulted with NMFS in accordance with ESA for right whales and will consult with NMFS and obtain an LOA in accordance with MMPA prior to the commencement of training activities on the range.
Duke Environmental Law & Policy Clinic	NGO-012.32	Mitigation Measures	Marine Mammal	Urge informing NMFS Stranding Coordinators within 24 hours of start of each event to increase detection of sonar-induced strandings.	Please refer to Subchapter 6.1.4: The Navy would coordinate with NMFS Stranding Coordinators for any unusual marine mammal behavior that may occur coincident with Navy training activities. These measures have been developed in full consideration of the recommendations of NMFS.

Name/Agency	Letter Number	Comment Category	Comment Subcategory	Comments	Response
Cetacean Society International / Rossiter, William	NGO-014.20	Mitigation Measures	Marine Mammal	No acoustic warning has proven to cause whales to avoid approaching ships, but Navy should support research to develop one.	Please refer to Subchapter 6.1.3.2. Navy has an active program for research on the effect of sound on marine mammals.
Cetacean Society International / Rossiter, William	NGO-014.21	Mitigation Measures	Marine Mammal	Whales may be confused and alarmed by ship activity, which may cause stress (more so in mothers and calves).	The Navy has begun a program that monitors potential effects to marine mammals at the Jacksonville USWTR (refer to Chapter 6). Through the Navy's marine mammal monitoring program, we will be able to establish baseline occurrence information. The Navy coordinated with NMFS under the ESA, any required mitigation measures will be implemented.
Cetacean Society International / Rossiter, William	NGO-014.22	Mitigation Measures	Marine Mammal	Navy should consider scientific aerial surveys for whales before training on the USWTR.	Please refer to the revised Subchapter 6.1.2.3: Helicopters would observe/survey the vicinity of an ASW exercise for 10 minutes before the first deployment of active (dipping) sonar in the water.
Southern Environmental Law Center / Wannamaker, Catherine M.	NGO-017.12	Mitigation Measures	Marine Mammal	Lookouts are limited in effectiveness, limited by visibility, wave height and low frequency of whale surfacing (right whales are particularly difficult to spot due to infrequent surfacing and dark color).	Please refer to Subchapter 6.1.2.2: Lookouts will use different techniques, including Night Lookout Techniques, during periods of low light. Passive sonar and aerial monitoring are also used during all ASW activities to detect the presence of marine mammals.

Name/Agency	Letter Number	Comment Category	Comment Subcategory	Comments	Response
Southern Environmental Law Center / Wannamaker, Catherine M.	NGO-017.33	Mitigation Measures	Marine Mammal	DEIS claims that mitigation will reduce harassment numbers, but does not explain mitigation specific to bottlenose dolphins. Lookouts are ineffective in spotting dolphins.	Mitigation measures described apply to all marine species. Dolphins are relatively easy to see due to short and shallow dives.
Southern Environmental Law Center / Wannamaker, Catherine M.	NGO-017.57	Mitigation Measures	Marine Mammal	Lack of support for effectiveness of passive listening, both by not discussing vocalization behavior or detailing personnel effort level.	Subchapter 6.1.2.5.1 discusses passive listening and vocalization by marine mammals. Passive acoustics are used as a cueing tool for visual lookouts. Vocalization is frequent enough that passive listening will detect marine mammals far from sonar sources (Tyack and Miller, 2002).
Southern Environmental Law Center / Wannamaker, Catherine M.	NGO-017.60	Mitigation Measures	Marine Mammal	DEIS ship strike mitigation is deficient: stated as only taking place during calving season, based on false belief of lookout effectiveness, doesn't specify speed limits.	The Navy consulted with NMFS under the ESA, and will consult under MMPA prior to commencement of training activities on the range. Any required mitigation measures will be implemented. Lookouts will use different techniques (see Subchapter 6.1.2.2), including Night Lookout Techniques, during periods of low light. Passive sonar and aerial monitoring are also used during all ASW activities to detect the presence of marine mammals.
Southern Environmental Law Center / Wannamaker, Catherine M.	NGO-017.64	Mitigation Measures	Marine Mammal	Recommend that Navy observe NMFS 10 knot limit when traveling to and from USWTR.	Please refer to Table 6-3 for a list of areas where the Navy will use additional mitigation measures to reduce the potential for ship strikes with North Atlantic right whales. Navy vessels travel at speeds consistent with mission and safety.

Name/Agency	Letter Number	Comment Category	Comment Subcategory	Comments	Response
Southern Environmental Law Center / Wannamaker, Catherine M.	NGO-017.65	Mitigation Measures	Marine Mammal	Navy should not use sonar when whales are present; monitoring for whales using passive acoustics, aerial surveys, telemetry, predictive modeling, satellite imagery, and a pilot boat. Lookouts could use infrared and light amplification during low light.	The Navy consulted with NMFS under the ESA, and will consult under MMPA prior to commencement of training activities on the range. Any required mitigation measures will be implemented. Lookouts will use different techniques (see Subchapter 6.1.2.2), including Night Lookout Techniques, during periods of low light. Passive sonar and aerial monitoring are also used during all ASW activities to detect the presence of marine mammals.
Southern Environmental Law Center / Wannamaker, Catherine M.	NGO-017.66	Mitigation Measures	Marine Mammal	Navy could begin with low sonar levels ("ramping up") (or use other alarms) to encourage animals to move away from area, before conducting full operating levels.	Please refer to Subchapter 6.6: ramp-up was considered but eliminated because ramp-up would not be viable during training exercises, as it would alert target submarine to the location of searching unit(s).
Earthjustice / Renshaw, Katie	NGO-019.26	Mitigation Measures	Marine Mammal	Acoustic mitigation [passive acoustic monitoring] is flawed as mammal must be detected before implementation.	Subchapter 6.1.2.5.1 discusses passive acoustic monitoring and vocalization by marine mammals. Passive acoustics are used as a cueing tool for visual lookouts. Vocalization is frequent enough that passive listening will detect marine mammals far from sonar sources (Tyack and Miller, 2002).

Name/Agency	Letter Number	Comment Category	Comment Subcategory	Comments	Response
Earthjustice / Renshaw, Katie	NGO-019.31	Mitigation Measures	Marine Mammal	No support for sonar reduction and shut-down zone distances and level of reduction (p.6-7). Navy's own data shows that greater zones would have environmental benefit without harming mission. Are they effective vs. lookout ability?	Safety zones will be applied beginning at 3,000 feet, which is greater than the typical range to potentially cause a temporary or permanent threshold shift. Active sonar transmissions would cease if a marine mammal was detected within 600 feet. Please refer to Subchapter 6.1.2 for additional information. In addition to lookouts, marine mammal presence will be monitored by passive acoustics during all ASW exercises.
Citizens Opposing Active Sonar Threats (COAST) / Wray, Russell	NGO-025.32	Mitigation Measures	Marine Mammal	Active sonar sources may move rapidly, decreasing detection efficiency of diving animals.	Please refer to Subchapter 6.1.2 for additional information. Passive sonar and aerial monitoring are also used during all ASW exercises to detect the presence of marine mammals.
Citizens Opposing Active Sonar Threats (COAST) / Wray, Russell	NGO-025.73	Mitigation Measures	Marine Mammal	Safety zones discussed on page 6-7 are too small.	Safety zones will be applied beginning at 3,000 feet, which is greater than the typical range to potentially cause a temporary or permanent threshold shift. Active sonar transmissions would cease if a marine mammal was detected within 600 feet. Please refer to Subchapter 6.1.2 for additional information. Refer to Subchapter 6.6 as to why safety zones cannot be increased further.

Name/Agency	Letter Number	Comment Category	Comment Subcategory	Comments	Response
Citizens Opposing Active Sonar Threats (COAST) / Wray, Russell	NGO-025.77	Mitigation Measures	Marine Mammal	Set 600' safe distance of dipping sonar drop from a marine mammal is insufficient, as animal can be injured by sonar at greater distance.	Mitigation was designed to avoid the potential for temporary threshold shift (TTS); this distance would avoid this impact. The Navy will apply to NMFS for an LOA prior to commencement of training activity, and additional appropriate mitigation measures will be identified.
Citizens Opposing Active Sonar Threats (COAST) / Wray, Russell	NGO-025.78	Mitigation Measures	Marine Mammal	[Re: p.6-8] Dolphins may have other intention other than riding bow wave. Travel to and away from the bow wave may cross transmission axis of sonar.	All mitigation measures are applicable to dolphins until bow riding behavior is observed. Once the dolphin ceases bow-riding, mitigation measures will again be implemented.
Natural Resources Defense Council (NRDC)	NGO-026.113	Mitigation Measures	Marine Mammal	Safety zone should be expanded to a 4km or 2km shutdown.	The Navy will apply to NMFS for an LOA prior to training activities, and additional appropriate mitigation measures will be identified. Safety zones will be applied beginning at 3,000 feet, which is greater than the typical range to potentially cause a temporary or permanent threshold shift. Refer to Subchapter 6.6 as to why safety zones cannot be increased further.
Natural Resources Defense Council (NRDC)	NGO-026.114	Mitigation Measures	Marine Mammal	Exercises should be suspended or relocated when species are detected in the vicinity.	Please refer to Subchapter 6.1.2.3: Active sonar will be suspended if marine mammal are detected within 600 feet of sonar dome. The Navy will apply to NMFS for an LOA prior to training activities, and additional appropriate mitigation measures will be identified.

Name/Agency	Letter Number	Comment Category	Comment Subcategory	Comments	Response
Natural Resources Defense Council (NRDC)	NGO-026.120	Mitigation Measures	Marine Mammal	Passive acoustic monitoring recommended, using range instrumentation, sonobuoys, and hydrophone arrays.	Please refer to the revised Subchapter 6.1.3.1: Monitoring. Passive sonar, using all capable range instrumentation, would be used during all ASW exercises on USWTR to detect the presence of marine mammals.
Natural Resources Defense Council (NRDC)	NGO-026.3	Mitigation Measures	Marine Mammal	DEIS does not adequately propose mitigation of sonar, including methods already employed by other navies.	Please refer to the revised Chapter 6.
Natural Resources Defense Council (NRDC)	NGO-026.40	Mitigation Measures	Marine Mammal	NMFS has restrictions on low flying aircraft due to adverse reaction of bowhead whales.	Please refer to the revised Chapter 6, and see Subchapter 4.3.10 - Aircraft Noise.
Natural Resources Defense Council (NRDC)	NGO-026.9	Mitigation Measures	Marine Mammal	Cryptic and long-diving marine mammals cannot be effectively spotted from fast-moving ships.	Please refer to the revised Subchapter 6.1.2.5.1. Visual detection methods will be supplemented by passive acoustic monitoring and aerial surveys.
Natural Resources Defense Council (NRDC)	NGO-026.95	Mitigation Measures	Marine Mammal	DEIS doesn't consider seasonal restrictions of training, to protect species of interest.	Please refer to the revised Chapter 6. The Navy will implement additional seasonal mitigation measures, such as additional seasonal measures for North Atlantic right whales during calving season. The Navy needs to train year-round to meet worldwide deployment schedule.

Name/Agency	Letter Number	Comment Category	Comment Subcategory	Comments	Response
Natural Resources Defense Council (NRDC)	NGO-026.98	Mitigation Measures	Marine Mammal	Discrepancy in 6 dB reduction 'safe zone' size between pages 6-26 (1,000 yards), and 6-7 (2,000 yards). DEIS should explain any difference from safe zones used in other ranges.	Please refer to the revised Chapter 6, relating to operating procedures, which resolves this discrepancy.
Capozzelli, J.	P-016.5	Mitigation Measures	Marine Mammal	Urgently request the Navy to adopt measures to keep whales safe. The measures include: identify low-risk areas for routine training; consistently establish appropriate safety zones around sonar-transmitting ships; and reduce source levels of sonar signals.	Please refer to the revised Subchapter 6.6 - Alternative Protective Measures Considered but Eliminated.
Cross, David and Rita	P-039.3	Mitigation Measures	Marine Mammal	Urges no training activity during whale migration in the area.	Navy needs to train year-round to support worldwide deployment schedules (see Subchapter 1.2). No whale mortalities are expected from USWTR activities (see analyses in Subchapter 4.3 and additional mitigation measures in Chapter 6).
Zinn, Rob	P-057.2	Mitigation Measures	Marine Mammal	Visual scouting is inadequate, urges further measures to adequately assess whether or not mammals are in the area (which may yield data for other agencies).	Please refer to Subchapter 6.1.2.2. Passive sonar and aerial monitoring are also used during all ASW activities to detect the presence of marine mammals.

Name/Agency	Letter Number	Comment Category	Comment Subcategory	Comments	Response
Kirkwood, Jennifer	P-090.2	Mitigation Measures	Marine Mammal	Urges adoption of mitigation measures (including seasonal limitation) to protect marine life from sonar.	Please refer to the revised Chapter 6 for mitigation measures planned for USWTR. The Navy consulted with NMFS in accordance with the ESA, and will consult under MMPA, with regards to right whales.
GA Dept of Natural Resources (GADNR) / Holcomb, Noel	S-018.8	Mitigation Measures	Marine Mammal	The Navy's emphasis on posting vessel lookouts as the primary operational means of avoiding marine mammal impacts is insufficient. Marine mammals are difficult to detect visually--even by trained observers. The probability of detecting marine mammals at night and in periods of inclement weather is even lower. Greater emphasis should be placed on real-time passive acoustic detection and visual detection of marine mammals by air prior to onset of USWTR activities.	Please refer to Subchapter 6.1.2.2. Lookouts will use different techniques, including night lookout techniques, during periods of low light. Passive sonar, using all capable range instrumentation, and aerial monitoring would be used during all ASW exercises to detect the presence of marine mammals.

Name/Agency	Letter Number	Comment Category	Comment Subcategory	Comments	Response
FL Department of Environmental Protection (FLDEP) / Griffin, Lynn (General)	S-020.43	Mitigation Measures	Marine Mammal	Please describe avoidance and mitigation procedures to be used when training exercises are conducted in low-visibility or at night? Could the night training be curtailed or altered if it is determined that marine mammals are present in the range during certain times of the year?	Please refer to Subchapter 6.1.2.2. Lookouts will use different techniques, including Night Lookout Techniques, during periods of low light. Lookouts will have night vision apparatuses. The Navy needs to train in all conditions to support worldwide deployment schedules. Please refer to Subchapter 1.2 for the need to train.
FL Fish and Wildlife Conservation Commission (FFWCC) / Poole, Mary Ann	S-021.3	Mitigation Measures	Marine Mammal	If Site A is ultimately chosen, we recommend that the Navy follows both the proposed Site A mitigation measures specified in the DEIS as well as the additional mitigation measures recommended below.	Please refer to the individual responses to each mitigation measure, below.

Name/Agency	Letter Number	Comment Category	Comment Subcategory	Comments	Response
FL Fish and Wildlife Conservation Commission (FFWCC) / Poole, Mary Ann	S-021.12	Mitigation Measures	Marine Mammal	In addition, the DEIS did not provide specifications, such as altitude, spatial or temporal extent, etc., for the aerial surveys that they propose to conduct prior to commencement of warfare exercises. The efficacy of aerial surveys for detecting all cetaceans in an area is fair at best and is dependent upon flight specifications as well as environmental factors (visibility, Beaufort Sea State levels, winds, etc.). Detectability of mom/calf pairs for standardized aerial surveys in the southeast has been estimated to be as low as 33% (Hain *et al.* 1999).	Text in Subchapter 6.1.2.3 has been revised for the FEIS to add that helicopters would observe the vicinity of the planned antisubmarine warfare (ASW) exercises ten minutes prior to the dipping of sonobuoys. Other methods for aerial surveillance prior to and during ASW activities are listed in Subchapter 6.1.2.3 of the DEIS.

Name/Agency	Letter Number	Comment Category	Comment Subcategory	Comments	Response
FL Fish and Wildlife Conservation Commission (FFWCC) / Poole, Mary Ann	S-021.13	Mitigation Measures	Marine Mammal	Because of the limitations of the proposed detection methods, we recommend that the Navy use additional methods for detecting the presence of marine mammals. Passive acoustic monitoring (e.g., using hydrophone arrays) provides greater detectabililty of vocalizing mammals than passive listening. Passive acoustic monitoring has been used previously by the Navy (Jarvis *et al.*2002) and other researchers (i.e., Clark *et al.* 1996), and should be employed routinely in naval exercises.	Please refer to Subchapter 6.1.2.6. The Navy is working to develop the capability to detect and localize vocalizing marine mammals using the installed sensor nodes (hydrophones) on the USWTR. The Navy is not yet capable of using the system nodes as a mitigation measure, however, as this science develops, it will be incorporated into the USWTR mitigation plan.
FL Fish and Wildlife Conservation Commission (FFWCC) / Poole, Mary Ann	S-021.14	Mitigation Measures	Marine Mammal	Additionally, the commonly publicized distance for recognizing human divers using sonar is a minimum of 700 m (i.e., http://www.arstech.de/diver_detection/diver_detection.html). Given that cetacean lungs are larger than human lungs, a cetacean should be detectable at a greater range than the customary 700 m for recognizing humans.	The Navy would use a different sonar system on USWTR (mid-frequency active sonar) than is used to detect human divers. Per operating procedures presented in revised Chapter 6, when a marine mammal is detected within 914 m of the sonar dome, sonar transmission is powered down (this distance was misprinted in the DEIS and has been corrected in the FEIS).

Name/Agency	Letter Number	Comment Category	Comment Subcategory	Comments	Response
FL Fish and Wildlife Conservation Commission (FFWCC) / Poole, Mary Ann	S-021.15	Mitigation Measures	Marine Mammal	We recommend that the Navy take advantage of current detection methods, and assist with funding additional research to develop and improve methods of detecting cetaceans and recording their behavioral responses to noise exposure, such as: (a) Deploy satellite and time-depth recorders to record behavioral responses, such as diving patterns and directional changes of right whales to proposed activities, including ship transit and exposure to sonar. (b) Explore the use of low-power active sonar for detecting right whales and recording their behavioral responses to active sonar. (c) Develop a model of the propagation of sound in the shallow water environment of the chosen USWTR site for evaluating received sound levels if a marine mammal is inadvertently exposed during Navy exercises.	The Navy will implement a monitoring plan designed to investigate these issues during USWTR operation. The Navy's propagation model is appropriate for shallow water propagation.

Name/Agency	Letter Number	Comment Category	Comment Subcategory	Comments	Response
FL Fish and Wildlife Conservation Commission (FFWCC) / Poole, Mary Ann	S-021.17	Mitigation Measures	Marine Mammal	Although the Navy is proposing to reduce or cease active transmission levels when a whale or dolphin is detected within certain distances of the associated equipment (with reductions starting at 1,828 m and ceasing at 183 m), a marine mammal just outside of a 320-m detection limit could potentially receive > 181 dB re 1 µPa (based on a nominal source of 235 dB re 1 µPa @ 1 m of the SQS-53 sonar and the standard 6 dB decrease in SPL with a doubling of distance). Cetacean strandings in the Bahamas in March 2000, spatially and temporally coincident with naval exercises that were also using these mid-frequency sonars, could have been exposed to Sound Pressure Levels (SPL) of 160 dB re 1 µPa according to complex sound propagation models (International Council for the Exploration of the Sea [ICES] 2005).	The risk function was developed to account for potential responses down to 120 dB SPL specifically to encompass uncertainty and the potential for behavioral reactions in marine mammal species that may be affected by sounds perceived at levels just above ambient. The Navy research continues to look into the causal mechanisms of marine mammal strandings related to sonar. Please refer to Appendix D for a discussion of specific stranding events that have been putatively linked to potential sonar operations.

Name/Agency	Letter Number	Comment Category	Comment Subcategory	Comments	Response
FL Fish and Wildlife Conservation Commission (FFWCC) / Poole, Mary Ann (cont'd)	S-021.17 (cont'd)	Mitigation Measures	Marine Mammal	(cont'd) Likewise, strandings in the Canary Islands in September 2002 began soon after the start of naval exercises involving mid- frequency sonar (ICES 2005). The strandings mainly involved beaked whale species; however, effects of sound levels on other cetaceans, such as right whales females with calves, are largely unknown.	See above.
Duke Environmental Law & Policy Clinic	NGO-012.28	Mitigation Measures	Monitoring	Lookouts alone are insufficient to detect marine mammals and sea turtles (turtles spend 90% of their time underwater), and will not be effective at night or in poor conditions.	Please refer to Subchapter 6.1.2.5.1 and 6.1.2.5.2: Lookouts will use different techniques, including Night Lookout Techniques, during periods of low light. Lookouts will have night vision apparatuses. Lookouts will also be assisted by passive sonar (using all capable instruments) and aerial monitoring to detect marine animals.
Duke Environmental Law & Policy Clinic	NGO-012.33	Mitigation Measures	Monitoring	Urge alternative detection system, such as passive and active acoustics, to ID turtles and mammals prior to initiation of training.	All capable sensors will be used to aid in passive acoustic monitoring for marine mammals. Subchapter 6.1.2.6 discusses potential protective measures under development.
Duke Environmental Law & Policy Clinic	NGO-012.41	Mitigation Measures	Monitoring	Urges employing adaptive management, altering operations as research expands our knowledge of marine environment.	Please refer to the new Subchapter 6.5. The Navy is committed to dynamic mitigation and management. If conditions or science changes, management will change in a timely manner.

Name/Agency	Letter Number	Comment Category	Comment Subcategory	Comments	Response
Cetacean Society International / Rossiter, William	NGO-014.1	Mitigation Measures	Monitoring	DEIS should be a platform for Navy to describe sponsored research to improve at-sea detection of marine mammals and turtles.	Proposed Navy research is discussed on the Ocean Stewardship Web site: www.navy.mil/oceans.
Cetacean Society International / Rossiter, William	NGO-014.10	Mitigation Measures	Monitoring	Lookouts are insufficient to detect animals, and are moot above Beaufort 4. Detection must be better.	See revised Subchapter 6.1.3.1 Monitoring. Passive sonar (using all capable range instrumentation) and aerial monitoring, would be used during all ASW exercises to detect the presence of marine mammals.
Southern Environmental Law Center / Wannamaker, Catherine M.	NGO-017.3	Mitigation Measures	Monitoring	DEIS mitigation is deficient, lookouts are not effective due to oft-submergence of marine life.	Please refer to the revised Subchapter 6.1.3.1 Monitoring. Passive sonar (using all capable range instrumentation) and aerial monitoring, would be used during all ASW exercises to detect the presence of marine mammals.
Southern Environmental Law Center / Wannamaker, Catherine M.	NGO-017.63	Mitigation Measures	Monitoring	Monitoring programs should begin before installation of USWTR to ensure effective collection of data of impact of sonar.	Marine mammal monitoring program has begun.
Earthjustice / Renshaw, Katie	NGO-019.27	Mitigation Measures	Monitoring	Passive monitoring equipment should be installed with the range's cables and nodes to improve detection.	Please refer to the revised Subchapter 6.1.3.1 Monitoring. Passive sonar (using all capable range instrumentation) would be used during all ASW exercises to detect the presence of marine mammals.

Name/Agency	Letter Number	Comment Category	Comment Subcategory	Comments	Response
Earthjustice / Renshaw, Katie	NGO-019.28	Mitigation Measures	Monitoring	Should use infrared technology as part of detection protocol.	Please refer to Subchapter 6.1.2.3. Lookouts will also have night vision devices available for use.
Earthjustice / Renshaw, Katie	NGO-019.29	Mitigation Measures	Monitoring	Should plan for installation of underwater cameras along range perimeter to detect marine mammals (similar to "Sea Otter" cameras).	Visual detection ranges at depth are severely limited and would therefore not provide any additional mitigation effectiveness.
Earthjustice / Renshaw, Katie	NGO-019.32	Mitigation Measures	Monitoring	Emergency plan should be in place if a stranding occurs or marine mammals show erratic behavior that could result in a stranding. Coordination with researchers and USWTR could yield important data on sonar and strandings.	Please refer to the revised Subchapter 6.1.3.1. The Navy will coordinate with the local NMFS Stranding Coordinator for any unusual marine mammal behavior, or any stranding, beached live/dead or floating marine mammals that may occur at any time during or within 24 hours after completion of any exercise using mid-frequency active sonar.
Citizens Opposing Active Sonar Threats (COAST) / Wray, Russell	NGO-025.44	Mitigation Measures	Monitoring	Median dive times of 20-29 min indicate that whales will be extremely difficult to detect, making mitigation less effective.	The modeling results, predicting no marine mammal mortality due to sonar (see Subchapter 4.3), assume no mitigation measures; therefore, effects could potentially be lessened by implementation of the mitigation measures. Lookouts would be supplemented by passive sonar, (using all capable range instrumentation) and aerial monitoring during all ASW exercises.

Name/Agency	Letter Number	Comment Category	Comment Subcategory	Comments	Response
Citizens Opposing Active Sonar Threats (COAST) / Wray, Russell	NGO-025.61	Mitigation Measures	Monitoring	Mitigation/detection is ineffective to ensure that mammals and turtles will not be in area of deployment.	The mitigation measures for USWTR were developed in coordination with NMFS.
Citizens Opposing Active Sonar Threats (COAST) / Wray, Russell	NGO-025.70	Mitigation Measures	Monitoring	Lookouts are ineffective for mammals and turtles due to long dive times and adverse conditions. Barlow and Gisiner (2004): Sighting rates for beached whales is about 2%.	Multiple lookouts will be supplemented by passive sonar (using all capable range instrumentation) and aerial surveys (when available) during ASW exercises conducted on USWTR. Please refer to the new Table 6-2 for marine mammal detection probability.
Citizens Opposing Active Sonar Threats (COAST) / Wray, Russell	NGO-025.71	Mitigation Measures	Monitoring	Passive acoustics are ineffective as animals must be making enough sound to be distinguishable from background sounds. Mammals are not always vocalizing, and turtles do not produce much sound.	Subchapter 6.1.2.5.1 discusses passive acoustic monitoring and vocalization by marine mammals. Passive acoustics are used as a cueing tool for visual lookouts. Vocalization is frequent enough that passive listening will detect marine mammals far from sonar sources (Tyack and Miller, 2002). Passive monitoring is one of many tools the Navy uses. Refer to Chapter 6 for other mitigation measures.
Citizens Opposing Active Sonar Threats (COAST) / Wray, Russell	NGO-025.72	Mitigation Measures	Monitoring	Crew pressure, or hesitation may cause Lookout to not report sighting, particularly if unsure or if sighting occurs outside "safe zone."	There is no evidence to support this claim. Navy lookouts report all seen anomalies (regardless of distance), take their responsibilities very seriously, and are trained to objectively follow proper procedures.

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Citizens Opposing Active Sonar Threats (COAST) / Wray, Russell	NGO-025.74	Mitigation Measures	Monitoring	Conditions where transmission is raised back to set levels do not guarantee that an animal has left the area, as animals may return and/or be submerged for that period of time.	Lookouts, passive sonar, and aerial observations would be used continuously before and during training exercises to detect marine mammals. If marine mammals are detected (by any means) within the safety zone during shut-down, the shut-down period would be reset.
Citizens Opposing Active Sonar Threats (COAST) / Wray, Russell	NGO-025.76	Mitigation Measures	Monitoring	Helicopter survey insufficient to ensure no animals in drop zone.	Please refer to Subchapter 6.1.2.5.

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Citizens Opposing Active Sonar Threats (COAST) / Wray, Russell	NGO-025.79	Mitigation Measures	Monitoring	Navy biologists (and those receiving Navy funding) are less likely to be independent (monitoring and research).	This statement is not true. The Navy is responsible for conducting the environmental analysis for USWTR, much of which was done in coordination with NMFS. Researchers funded by the Navy are widely acknowledged to be leaders in their field and they are given the latitude to conduct the proposed research as they see fit. They also are encouraged to publish the results of their research in the open, peer-reviewed scientific literature which is subject to public and expert scrutiny. The Navy has not restricted the interpretation or publication of any research it supports. This research has been favorably reviewed by three NRC panels over the past seven years. It was also reviewed by three panels of independent experts that returned strongly favorable conclusions concerning the quality of research emerging from the program. All scientists, including both Navy scientists and independent scientists whose research is funded in part by the Navy, validate their work through a variety of methods.

Name/Agency	Letter Number	Comment Category	Comment Subcategory	Comments	Response
Citizens Opposing Active Sonar Threats (COAST) / Wray, Russell	NGO-025.85	Mitigation Measures	Monitoring	Hain et al. 1999: only a 33% detection probably by lookouts (11% when further than 1.5 miles). Lookouts are obviously ineffective.	Please see new Table 6-2 for marine mammal detection probabilities. Multiple lookouts will be posted and supplied with aids for visual detection. Passive sonar (using all capable instruments), and aerial detection will also be used during all ASW activities to detect the presence of marine mammals.
Citizens Opposing Active Sonar Threats (COAST) / Wray, Russell	NGO-025.88	Mitigation Measures	Monitoring	Rationale for eliminating third-party lookouts and monitors (security reasons) is poor. Third party more likely to be impartial, and security clearance could be gained.	Comment noted. Third party lookouts not as qualified nor as practical as Navy lookouts (see Subchapter 6.6). Navy trains all lookouts to be objective.
Citizens Opposing Active Sonar Threats (COAST) / Wray, Russell	NGO-025.89	Mitigation Measures	Monitoring	p.6-25 states that Navy will not reduce power during low-visibility training, or when surface ducts are present, but does not mention potential additional impacts caused by conducting exercises under these conditions.	Navy needs to train in all conditions to adequately train as they fight, and to support worldwide deployment schedules (See Subchapter 1.2 for need to train). All environmental conditions were considered when modeling for USWTR. Refer to Chapter 6 for mitigation measures enacted during low visibility training (including night lookout techniques). Due to the limited sonar affect range, interactions with the bottom or surface ducts are unlikely to be an issue.
Natural Resources Defense Council (NRDC)	NGO-026.102	Mitigation Measures	Monitoring	Use of only internal DoN 2007i,j,k references on lookout efficiency make the statements impossible to review.	These references are posted on the public USWTR Web site.

Name/Agency	Letter Number	Comment Category	Comment Subcategory	Comments	Response
Natural Resources Defense Council (NRDC)	NGO-026.119	Mitigation Measures	Monitoring	Dedicated aerial monitors should be employed during chokepoint, near-coastal, and major exercises.	These exercises will not occur on USWTR.
Natural Resources Defense Council (NRDC)	NGO-026.121	Mitigation Measures	Monitoring	Recommend no exercises during low light/visibility.	Navy needs to train in all conditions in order to train as they fight, and support worldwide deployment schedules. See Subchapter 1.2 for need to train. See Subchapter 6.1.2.3 for additional low light detection methods.
Natural Resources Defense Council (NRDC)	NGO-026.122	Mitigation Measures	Monitoring	Third party monitors should survey range before, during, and after major exercises. Coordination with other agencies for research coinciding with USWTR, including making survey data available.	The Navy will coordinate with NMFS to establish a monitoring plan. Monitoring program data will be made available to the public. Third party lookouts not as qualified nor as practical as Navy lookouts, and are additional security risks (see Subchapter 6.6).
Natural Resources Defense Council (NRDC)	NGO-026.126	Mitigation Measures	Monitoring	Navy should be dedicated to future research and technology development to further reduce impacts.	Navy is scheduled to spend approximately $26 million/year on research for at least the next five years. Additional information can be found on www.navy.mil/oceans
Natural Resources Defense Council (NRDC)	NGO-026.128	Mitigation Measures	Monitoring	Timely reporting of exercises and mitigation measures used should be made to NOAA, state, and public authorities.	Reporting requirements are developed with NMFS while issuing the LOA and biological opinion (BO).

Name/Agency	Letter Number	Comment Category	Comment Subcategory	Comments	Response
Natural Resources Defense Council (NRDC)	NGO-026.42	Mitigation Measures	Monitoring	Navy has contracted monitoring of Site C, but no preliminary results are available.	Data from survey effort will be made available when analysis has been completed. Site C is no longer the preferred alternative.
Natural Resources Defense Council (NRDC)	NGO-026.99	Mitigation Measures	Monitoring	Lookouts ineffective, only 33% detection efficiency, and 11% efficiency within 1.5 miles (in ideal conditions). Beaked whales are more difficult to detect than these estimates.	Please refer to the revised Subchapter 6.1.3.1 Monitoring and the new Table 6-2 for marine mammal detection probabilities. Lookouts would be supplemented by passive sonar (using all capable range instrumentation) and aerial monitoring during all ASW exercises to detect the presence of marine mammals.
Berkman, Budd	P-017.3	Mitigation Measures	Monitoring	Naval training operation should be accomplished with marine biologists on board with the utmost care towards marine life.	Comment noted. Please refer to Subchapter 6.6 for mitigation measures considered but not implemented.
Nowlin, Michelle	P-035.5	Mitigation Measures	Monitoring	Mitigation section focuses completely on marine mammals, and measures are incomplete and limited.	Please refer to the revised Chapter 6 for additional planned mitigation measures.
Nowlin, Michelle	P-035.9	Mitigation Measures	Monitoring	Consider adaptive management with the operation of the USWTR; as new information becomes available, and information is gathered from the USWTR; to better understand the impacts of the range.	Please refer to the new Chapter 6.5: Dynamic Mitigation.

Name/Agency	Letter Number	Comment Category	Comment Subcategory	Comments	Response
Booher, Sam	P-040.14	Mitigation Measures	Monitoring	No evidence of the Navy applying mitigation measures after being urged to in 2006.	Please refer to the revised Chapter 6. Mitigation plan developed in coordination with NMFS.
Van Saum, David	P-058.1	Mitigation Measures	Monitoring	USWTR would allow for monitoring of marine mammals further than 50 miles from shore	Comment noted. The Navy will implement a monitoring plan for USWTR. The Navy is in consultation with NMFS in accordance with the ESA, and will consult NMFS under MMPA, with regards to monitoring.
Armstrong, Frances T.	P-069.2	Mitigation Measures	Monitoring	Lookouts are not adequate in detecting marine mammals.	Multiple lookouts will be posted on each vessel, with aids for visual detection. Passive sonar and aerial detection are also used during all ASW activities to detect the presence of marine mammals. Please refer to the new Table 6-2 for marine mammal detection probabilities.
VA Dept of Game and Inland Fisheries (VDGIF) / Ewing, Amy	S-015.9	Mitigation Measures	Monitoring	Recommend trained, third party, lookouts to ensure compliance of mitigation measures, suspend training when conditions are suboptimal for marine mammal detection, and remove any possible expended training materials immediately upon completion of training.	Third party lookouts are not as qualified nor as practical as Navy lookouts, and are additional security risks (see Subchapter 6.6). Training must take place in all conditions to meet worldwide deployment schedule (Chapter 1). Mitigation measures to be used are addressed in Chapter 6. Expended materials are retrieved as soon as possible after exercise, as described in Subchapter 4.1.1.

Name/Agency	Letter Number	Comment Category	Comment Subcategory	Comments	Response
GA Dept of Natural Resources (GADNR) / Holcomb, Noel	S-018.7	Mitigation Measures	Monitoring	The Navy's Integrated Comprehensive Monitoring Program (ICMP) should include a program for monitoring the long-term acoustic effects of USWTR activities on the project area and the adjacent right whale calving grounds. This program should be implemented in cooperation with NMFS and independent researchers.	Comment noted. The Navy will be implementing a monitoring program for USWTR in coordination with NMFS in accordance with the Marine Mammal Protection Act and the Endangered Species Act.
FL Department of Environmental Protection (FLDEP) / Griffin, Lynn (General)	S-020.44	Mitigation Measures	Monitoring	According to previous text, if a marine mammal is spotted in the area of the exercises there are procedures in place to offset any potential impact to the animal. Would this information be noted in a record for the training maneuvers? If so, could the information regarding the animal(s) be relayed to the scientific community after the maneuvers are completed and analyzed?	The Navy has developed a monitoring program that will provide results that will be shared with the scientific community, although lookouts are not trained in the identification of specific marine mammal species.

Name/Agency	Letter Number	Comment Category	Comment Subcategory	Comments	Response
FL Fish and Wildlife Conservation Commission (FFWCC) / Poole, Mary Ann	S-021.19	Mitigation Measures	Monitoring	We commend the Navy's support of the EWS aerial surveys and recognize the important role Fleet Area Control and Surveillance Facility Jacksonville plays in the dissemination of right whale sightings. The EWS aerial surveys serve a vital role in right whale research and management in the Southeast U.S. (e.g., ship strike mitigation, photo-identification data, detection of entangled or dead whales). The Navy should continue to support the EWS and ensure that increases in Navy training exercises do not interfere with EWS aerial surveys or hinder survey efforts as a result of airspace closures.	The Navy provides about $175,000 per year in support of EWS surveys. The USWTR training will not interfere with EWS aerial surveys.
Marine Mammal Commission / Ragen, Timothy J.	F-004.3	Mitigation Measures	Operations	Recommends analysis of effectiveness of mitigation measures in the FEIS.	This analysis will be conducted as part of the monitoring program.

Name/Agency	Letter Number	Comment Category	Comment Subcategory	Comments	Response
Provincetown Center for Coastal Studies / Delaney, Richard F.	NGO-011.4	Mitigation Measures	Operations	Urges 10 knot speed limit specified by NOAA, comprehensive monitoring of marine mammal presence (akin to Sighting Advisory System), and a PAM system to aid in detection of vocalizing marine mammals - required by NOAA's 20008 Incidental Harassment Authorization (for the Neptune LNG facility).	The Navy vessels travel at a safe speed in accordance with the USCG "Rules of the Road," found here: http://www.navcen.uscg.gov/mwv/navrules/rotr_online.htm. See Chapter 6 for the discussion of the ship strike avoidance measures and other mitigation measures that will be employed.
Duke Environmental Law & Policy Clinic	NGO-012.27	Mitigation Measures	Operations	Section on Mitigation is inadequate due to no substantive measure to: offset acoustic impacts, lower vessel strike potential, or minimize harm from debris. No discussion on mitigating turtle impacts. No consideration of comments from previous DEIS. Must consider all measures, implement all possible, and explain why others can't be implemented.	Please refer to the revised Chapter 6.
Duke Environmental Law & Policy Clinic	NGO-012.34	Mitigation Measures	Operations	Urge slowing ships near shore and when turtles or mammals have been detected. Slower speeds will aid in detection, and lessen risk of collision.	Comment noted. The Navy has mitigation procedures in place to aid in the detection of sea turtles and marine mammals to reduce the risk of collision. In addition, the Navy consults with NMFS regarding all aspects of naval activities that may impact these species.

Name/Agency	Letter Number	Comment Category	Comment Subcategory	Comments	Response
Duke Environmental Law & Policy Clinic	NGO-012.35	Mitigation Measures	Operations	Urges use of biodegradable materials in parachutes and assemblage, to lessen hazard.	Comment noted.
Cetacean Society International / Rossiter, William	NGO-014.11	Mitigation Measures	Operations	DEIS lists speed limits that are undefined. Strict, definite limits must be established, or a captain's judgment may lead the ship to go at unsafe speeds.	Vessels will travel at a safe speed that is dependent on the situation to allow the ship to maneuver around any navigational hazards (including surfaced animals). The Navy vessels travel at a safe speed in accordance with the USCG "Rules of the Road", found here: http://www.navcen.uscg.gov/mwv/navrules/rotr_online.htm. See Chapter 6 for the discussion of the ship strike avoidance and other mitigation measures that will be employed.
Cetacean Society International / Rossiter, William	NGO-014.14	Mitigation Measures	Operations	Testing of sonar before training must be mitigated as well.	The potential impacts of the use of sonar in open waters for testing purposes is analyzed in other Navy NEPA documents including, but not limited to, the Atlantic Fleet Active Sonar Training (AFAST) EIS. Those other documents are coordinated with NMFS and mitigated as required.
Cetacean Society International / Rossiter, William	NGO-014.17	Mitigation Measures	Operations	Limiting training to times when right whales are less likely to be present will limit training, and only be effective for Jacksonville alternative	The Navy must train year-round to meet worldwide deployment schedule. Please refer to Chapter 6.6.

Name/Agency	Letter Number	Comment Category	Comment Subcategory	Comments	Response
Southern Environmental Law Center / Wannamaker, Catherine M.	NGO-017.13	Mitigation Measures	Operations	DEIS does not consider strikes by submarines, nor any mitigation measures on vessels that can't have lookouts.	Please refer to the revised Subchapter 6.1.3.1: Monitoring. Passive sonar, using all capable range instrumentation, would be used during all ASW exercises on USWTR to detect the presence of marine mammals. There are no records of a submarine ever hitting a whale.
Southern Environmental Law Center / Wannamaker, Catherine M.	NGO-017.14	Mitigation Measures	Operations	DEIS fails to adopt vessel speed limits to reduce ship strikes.	Vessels will travel at a safe speed which allows the ship to maneuver around any navigational hazards (including surfaced animals). The Navy vessels travel at a safe speed in accordance with the USCG "Rules of the Road", found here: http://www.navcen.uscg.gov/mwv/navrules/rotr_online.htm. See Chapter 6 for ship strike mitigation.
Southern Environmental Law Center / Wannamaker, Catherine M.	NGO-017.15	Mitigation Measures	Operations	DEIS fails to explain how ship strikes during installation and instrumentation will be minimized. Trunk cable will be installed through right whale breeding habitat, and assessment of 'only a brief period' is not informative enough.	Please refer to the revised Subchapters 6.4 and 6.2, related to mitigation of cable installation at sea, and protective measures related to vessel transit and right whales, respectively.
Southern Environmental Law Center / Wannamaker, Catherine M.	NGO-017.62	Mitigation Measures	Operations	DEIS makes no attempt to examine alternate mitigation for debris, such as partial retrieval.	The Navy minimizes the accumulation of debris as much as possible. Sonobuoys and parachutes are designed to sink after use; therefore, it would be extremely difficult to retrieve them. The best available science is used to assess impact of expended materials on the marine environment.

Name/Agency	Letter Number	Comment Category	Comment Subcategory	Comments	Response
Earthjustice / Renshaw, Katie	NGO-019.25	Mitigation Measures	Operations	Effectiveness of mitigation listed in DEIS is unsupported. Should consider additional past practices.	Please refer to the revised Chapter 6. The Navy has past experience implementing similar mitigation measures and continues to track the effectiveness of the measures.
Citizens Opposing Active Sonar Threats (COAST) / Wray, Russell	NGO-025.69	Mitigation Measures	Operations	Assumptions of limited impact based on effective mitigation are flawed.	Please refer to the revised Chapter 6. The Navy has past experience implementing similar mitigation measures and continues to track the effectiveness of the measures.
Citizens Opposing Active Sonar Threats (COAST) / Wray, Russell	NGO-025.87	Mitigation Measures	Operations	Cannot guarantee cable installation will not affect mammals and turtles, due to their unpredictable behavior.	Please refer to Subchapter 6.4 for mitigation measures related to cable installation.
Natural Resources Defense Council (NRDC)	NGO-026.100	Mitigation Measures	Operations	DEIS does not consider other common mitigation techniques for active sonar: avoiding coastal water, high-value habitat, and complex topography; larger safety zones; passive acoustic monitoring for whales; consideration for surface ducting & low visibility conditions; monitoring and shutdown for sea turtles and fish schools.	The EIS does consider and implement the common mitigation techniques for active sonar. The additional measures identified in this comment are not feasible; see Subchapter 6.6 for mitigation measures considered but eliminated.

Name/Agency	Letter Number	Comment Category	Comment Subcategory	Comments	Response
Natural Resources Defense Council (NRDC)	NGO-026.107	Mitigation Measures	Operations	Navy should establish coastal exclusion zone for acoustics use, either 25 NM from coast, or shoreward of 1500m isobath.	Please refer to Subchapter 2.3. All USWTR sites are more than 40 NM offshore (e.g. Site A - 50 NM offshore). The purpose and need of the project requires conducting exercises in isobaths of 37 - 274 m.
Natural Resources Defense Council (NRDC)	NGO-026.111	Mitigation Measures	Operations	Exercises should be concentrated in abyssal waters and habitat of lower value to species.	The water is too deep in the abyssal plain to meet the purpose and need. Please refer to Subchapter 2.3: the purpose and need of the project requires conducting exercises in isobaths of 37 - 274 m.
Natural Resources Defense Council (NRDC)	NGO-026.112	Mitigation Measures	Operations	Active acoustics should be kept at lowest level possible, with standards for different scenarios.	The Navy aims to use the lowest level of sound possible, as it is also in the best interests of the exercise goal to use the lowest level. Please refer to Subchapter 6.6 for further explanation.
Natural Resources Defense Council (NRDC)	NGO-026.115	Mitigation Measures	Operations	Recommend using simulated geography to reduce chokepoint exercise in near-coastal areas.	None of the candidate sites are physically representative of choke points.
Natural Resources Defense Council (NRDC)	NGO-026.116	Mitigation Measures	Operations	Recommend reduction of training during times with significant surface ducting conditions, and reducing power when ducting is detected.	Please refer to Subchapter 6.6.

Name/Agency	Letter Number	Comment Category	Comment Subcategory	Comments	Response
Natural Resources Defense Council (NRDC)	NGO-026.117	Mitigation Measures	Operations	Recommend steaming paths that avoid embayments & provide escape routes for animals.	These geographic features do not exist on the USWTR sites.
Natural Resources Defense Council (NRDC)	NGO-026.118	Mitigation Measures	Operations	Recommend suspending/postponing chokepoint exercises during surface ducting, such exercises should be scheduled during daylight hours.	None of the candidate sites are physically representative of choke points. See Subchapter 6.6.
Natural Resources Defense Council (NRDC)	NGO-026.123	Mitigation Measures	Operations	Navy must apply mitigation prescribed by states, courts, U.S. Navy, other navies and research centers.	Mitigation measures have been coordinated with the NMFS. Those measures that apply are discussed in Chapter 6.
Natural Resources Defense Council (NRDC)	NGO-026.125	Mitigation Measures	Operations	Possible reduction in source volume should be considered prior to every exercise.	See Subchapter 6.6. Navy aims to use the lowest level of sound possible to fulfill training purposes. It is beneficial for sonar accuracy to keep volumes low.
Natural Resources Defense Council (NRDC)	NGO-026.127	Mitigation Measures	Operations	Mitigation measures should be situation-specific.	Mitigation measures have been developed in coordination with NMFS based upon the platforms and their sensors. Mitigation measures will be maximized to the capabilities of the situation.

Name/Agency	Letter Number	Comment Category	Comment Subcategory	Comments	Response
Natural Resources Defense Council (NRDC)	NGO-026.129	Mitigation Measures	Operations	Additional mitigation may be necessary to adhere to NEPA, ESA, MMPA, and other acts.	Mitigation measures have been coordinated with the NMFS. Those measures that apply are discussed in Chapter 6.
Natural Resources Defense Council (NRDC)	NGO-026.133	Mitigation Measures	Operations	FEIS must discuss mitigation for local environment, hard bottom habitats, magnetic disruption of sea turtles and discharge of hazardous materials.	Mitigation measures have been coordinated with the NMFS. Please refer to the revised Chapter 6 for discussion of mitigation measures. Refer to Subchapter 4.1.2.2: the only potential hazardous release is unlikely, small releases of fuel from exercise torpedoes.
Fried, Debra	P-001.3	Mitigation Measures	Operations	Incomplete proposal of mitigation techniques of sonar use.	Mitigation measures have been coordinated with the NMFS. Those measures that apply are discussed in Chapter 6.
Booher, Sam	P-002.4	Mitigation Measures	Operations	Incomplete proposal of mitigation techniques of sonar use.	Mitigation measures have been coordinated with the NMFS. Those measures that apply are discussed in Chapter 6.
Martin, Alison	P-014.7	Mitigation Measures	Operations	Request that the Navy act responsibility and schedule the training as to not interfere with critical time periods (e.g., migration, breeding, feeding, etc.) of marine animals.	Navy needs to train year-round to support worldwide deployment schedules (see Subchapter 1.2). See discussion of mitigation measures in Chapter 6.

Name/Agency	Letter Number	Comment Category	Comment Subcategory	Comments	Response
Martin, Alison	P-014.8	Mitigation Measures	Operations	The DEIS is thorough and straightforward and real attempts are proposed to avoid impacts; however, additional steps can be accomplished to further reduce the potential for impacts (e.g., gather additional data, avoid marine life while using acoustics).	The Navy has conducted and supports future research on these topics. The Navy will conduct a monitoring program as described in Subchapter 6.1.3.1.
Eckert, Jaqueline	P-021.3	Mitigation Measures	Operations	Mitigation techniques of sonar, as described, are incomplete.	Please refer to the revised Chapter 6. Mitigation measures were developed in coordination with NMFS.
Cross, David and Rita	P-039.4	Mitigation Measures	Operations	Sonar sound level used on USWTR should be lowered to the standard set by NOAA.	NMFS [NOAA] is a cooperating agency in the preparation of this EIS. The analysis of the potential impacts of the use of sonar on USWTR and required mitigation have been coordinated with NMFS.
Hill, David	P-042.2	Mitigation Measures	Operations	DEIS does not properly address mitigation measures for sonar.	Please refer to the revised Chapter 6. Mitigation measures were developed in coordination with NMFS.
Zinn, Rob	P-057.1	Mitigation Measures	Operations	Sonic levels should be increased gradationally before exercises (ramping-up) in order to clear the area of marine life before training.	Please refer to Subchapter 6.6: ramp-up was considered but eliminated because of ramp-up would not be viable during training exercises, as it would alert target submarine to the location of searching unit(s).

Name/Agency	Letter Number	Comment Category	Comment Subcategory	Comments	Response
Armstrong, Frances T.	P-069.4	Mitigation Measures	Operations	DEIS fails to include 'safety measures'.	Chapter 6 contains a complete discussion of mitigation measures to be implemented for this project.
ten Hulzen, Kalinke	P-072.2	Mitigation Measures	Operations	Mitigation/safety measures needed.	Chapter 6 contains a complete discussion of mitigation measures to be implemented for this project.
McCormick, Maggie	P-079.2	Mitigation Measures	Operations	DEIS fails to include 'safety measures'.	Chapter 6 contains a complete discussion of mitigation measures to be implemented for this project.
North Carolina Division of Coastal Management (NCDCM) / Rynas, Stephen	S-003.2	Mitigation Measures	Operations	DEIS mitigation measures do not appear to address conducting construction and operation outside of moratorium periods. Comments to this should be included in the FEIS.	Construction will take place outside of right whale calving season, as presented in Subchapter 6.4. USFWS will be consulted if landside construction takes place during the nesting season of any protected turtle species, as presented in Subchapter 6.3.

Name/Agency	Letter Number	Comment Category	Comment Subcategory	Comments	Response
North Carolina Wildlife Resources Commission (NCWRC) / Dunn, Maria T.	S-005.6	Mitigation Measures	Operations	FEIS should include a list of mitigation measures with details. This should include: use of biodegradable materials, removal of debris construction time, methodology of spotters, species avoidance, ship speeds, and plans for adaptive management.	Please refer to revised Chapter 6 for information on material retrieval, spotter techniques, and speed restrictions. All attempts are made to recover expended materials. Construction time is outlined in Subchapter 2.2.1. The Navy is dedicated to adaptive management, and has implemented a monitoring program that will accompany USWTR activities to assess changes in marine mammals.

Name/Agency	Letter Number	Comment Category	Comment Subcategory	Comments	Response
GA Dept of Natural Resources (GADNR) / Holcomb, Noel	S-018.1	Mitigation Measures	Operations	Given the importance of Georgia and Florida coastal waters to endangered North Atlantic right whales, and given the proximity of the proposed USWTR range to the right whale calving grounds, our chief recommendation would normally be that the Navy avoid conducting USWTR activities between November 15 and April 15 each year (i.e. when right whales are present off Georgia and Florida). Unfortunately, this option has been explicitly eliminated from consideration in the DEIS/OEIS. We urge the Navy to reconsider this decision. Avoiding or significantly reducing the scope of ASW activities between November 15 and April 15 would be the simplest way to reduce potential impacts to right whales and right whale habitat.	The Navy has mitigation measures in place specific to operations conducted within the right whale critical habitat off the Georgia/Florida coasts that include posting additional lookouts, reducing speed and minimizing time spent in this area. Actual training on the range will occur further offshore than the coastal habitat preferred by mother/calf pairs. Construction during this period will be avoided, as detailed in Subchapter 6.4.
GA Dept of Natural Resources (GADNR) / Holcomb, Noel	S-018.2	Mitigation Measures	Operations	Installation of the range should occur between April 15 and November 15 to avoid impacting North Atlantic right whales.	Construction during the calving season will be avoided, as detailed in Subchapter 6.4.

Name/Agency	Letter Number	Comment Category	Comment Subcategory	Comments	Response
GA Dept of Natural Resources (GADNR) / Holcomb, Noel	S-018.10	Mitigation Measures	Operations	Navy vessels should travel at 10 knots (or minimum safe speed) while transiting through waters inhabited by right whales between November 15 and April 15. Exercises requiring greater vessel speeds should be conducted outside the right whales season or in location where right whales are not present. Contrary to the Navy's contention in the DEIS/OEIS, vessel speed limits are not arbitrary. The best available science indicates that whale mortality and serious injury is significantly reduced at speeds of 10 knots or less.	Navy vessels travel at a slow, safe speed in accordance with the U.S. Coast Guard "Rules of the Road," found at http://www.navcen.uscg.gov/mwv/navrules/rotr_online.htm. Also, Navy follows measures regarding transits as outlined in the 1997 Biological Opinion. The formal consultation with NMFS under Section 7 of the ESA will determine if additional mitigation measures are necessary.

Name/Agency	Letter Number	Comment Category	Comment Subcategory	Comments	Response
FL Department of Environmental Protection (FLDEP) / Griffin, Lynn	S-020.4	Mitigation Measures	Operations	A discussion of mitigation for unavoidable impacts to resources should be included in the DEIS and address impacts to all marine resources, not only marine mammals, resulting from the installation and operational use of the established training area. In particular, the DEIS should evaluate the need for mitigation of any potential long-term effects of operational waste materials left on the seafloor ecosystem.	The Navy is making every effort to minimize waste materials during installation and operation of the range (refer to revised Subchapter 4.1), and will adhere to all relevant regulatory requirements regarding mitigation of impacts.
FL Department of Environmental Protection (FLDEP) / Griffin, Lynn (General)	S-020.42	Mitigation Measures	Operations	There is no discussion of mitigation measures for impacts to benthic resources. Please detail measures that will be utilized to mitigate impacts to benthic resources.	The need for mitigation is being coordinated with the National Marine Fisheries Service in association with the Navy's EFH consultation. The Navy is conducting bottom mapping to avoid impacts to bottom habitat to the maximum extent possible.
Marine Mammal Commission / Ragen, Timothy J.	F-004.1	Mitigation Measures	Right Whale	Recommends abiding by NMFS Final Rule to Implement Speed Restrictions to Reduce the Threat of Ship Collisions with Northern Right Whales except in emergency situations.	The Final Rule (Oct 10, 2008) exempts federal vessels from the speed restrictions identified in the regulations. The Navy vessels travel at a safe speed in accordance with the USCG "Rules of the Road", found here: http://www.navcen.uscg.gov/mwv/navrules/rotr_online.htm.

Name/Agency	Letter Number	Comment Category	Comment Subcategory	Comments	Response
Marine Mammal Commission / Ragen, Timothy J.	F-004.5	Mitigation Measures	Right Whale	Recommends similar speed restrictions in additional times and areas due to uncertainty of right whale behavior.	The Final Rule (Oct 10, 2008) exempts federal vessels from the speed restrictions identified in the regulations. The Navy vessels travel at a safe speed in accordance with the USCG "Rules of the Road", found here: http://www.navcen.uscg.gov/mwv/navrules/rotr_online.htm.
Sierra Club / Larson, Tom	NGO-007.4	Mitigation Measures	Right Whale	Should plan for seasonal restrictions when Right Whales are present in the area.	Please refer to revised Chapter 6 for seasonal restrictions. No construction will take place in the critical habitat, and increased vessel vigilance will be used, during calving season. Year-round training is required to meet worldwide deployment schedule.
Cetacean Society International / Rossiter, William	NGO-014.16	Mitigation Measures	Right Whale	DEIS should include a cost/risk analysis of interrupted training due to presence of right whales.	EIS analysis concludes that the only impacts to right whales will be behavioral and temporary in nature.
Cetacean Society International / Rossiter, William	NGO-014.18	Mitigation Measures	Right Whale	Only 1/3 of right whale mothers+calves can be detected within 1.5 NM, and only 55% of those at surface are seen.	Comment noted.

Name/Agency	Letter Number	Comment Category	Comment Subcategory	Comments	Response
New England Aquarium	NGO-016.3	Mitigation Measures	Right Whale	Will the Navy follow the recent NMFS Final rule to Implement Speed Restrictions to Reduce the threat of Ship Collisions with North Atlantic Right Whales?	NMFS exempts military vessels from the these speed restrictions due to mitigation measures already in place as identified in Chapter 6 of USWTR EIS. The rule's ROD exempts military vessels from the these speed restrictions due to mitigation measures already in place as identified in Chapter 6 of USWTR EIS. Vessels will travel at a safe speed, dependent on the situation to allow the ship to maneuver around any navigational hazards (including surfaced animals). The Navy vessels travel at a safe speed in accordance with the USCG "Rules of the Road", found here: http://www.navcen.uscg.gov/mwv/navrules/rotr_online.htm.
Earthjustice / Renshaw, Katie	NGO-019.34	Mitigation Measures	Right Whale	Increase in vessel traffic poses threat to right whale, as they are susceptible to strikes, spend much of their time just below the surface, do not avoid vessels, and are difficult to spot.	The Navy does not expect an increase in ship traffic due to USWTR. Recovery of torpedoes would primarily be conducted by helicopters; so, there would be no significant increase in vessel traffic due to torpedo recovery. Regardless of the location of the range, Kings Bay- and Mayport-based vessels will continue to necessarily transit through the right whale critical habitat for all at-sea training. As presented in Subchapter 6.2, the Navy has implemented monitoring and protection measures to avoid impacts to right whales.

Name/Agency	Letter Number	Comment Category	Comment Subcategory	Comments	Response
Earthjustice / Renshaw, Katie	NGO-019.35	Mitigation Measures	Right Whale	Mitigation measures for avoiding ship strikes are not sufficiently discussed in DEIS.	Please refer to the revised Chapter 6 for discussion of mitigation measures related to ship strikes.
Earthjustice / Renshaw, Katie	NGO-019.36	Mitigation Measures	Right Whale	Ship speed limit is ineffective in mitigating ship strikes (in current wording), as Navy ships are free to go any speed it wishes.	The Navy vessels travel at a safe speed in accordance with the USCG "Rules of the Road", found here: http://www.navcen.uscg.gov/mwv/navrules/rotr_online.htm. NMFS exempts military vessels from the these speed restrictions due to mitigation measures already in place as identified in Chapter 6 of USWTR EIS. Vessels will travel at a safe speed dependent on the situation to allow the ship to maneuver around any navigational hazards (including surfaced animals).
Citizens Opposing Active Sonar Threats (COAST) / Wray, Russell	NGO-025.27	Mitigation Measures	Right Whale	Proposed mitigation will not ensure right whale protection.	The Navy consulted with NMFS under ESA, and will consult under MMPA, concerning impacts to right whales. Please see revised Subchapter 6.2 for specific mitigation measures for right whales.
Citizens Opposing Active Sonar Threats (COAST) / Wray, Russell	NGO-025.59	Mitigation Measures	Right Whale	Impact on right whale possible during installation - limitation of period as mitigation measures does not ensure zero interaction.	Installation outside of the calving season reduces the potential for interaction to near zero. Navy consulted with NMFS under ESA.

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Citizens Opposing Active Sonar Threats (COAST) / Wray, Russell	NGO-025.80	Mitigation Measures	Right Whale	Right whales may occur/migrate/birth away from pack, possibly making NMFS 'rolling dates' (6-17) and cable installation restrictions less effective.	Calving dates in the EIS have been expanded to November 15 to April 15.
Citizens Opposing Active Sonar Threats (COAST) / Wray, Russell	NGO-025.81	Mitigation Measures	Right Whale	Navy has previously killed a pregnant right whale while following the mitigation measures listed in DEIS, showing that they don't ensure right whales will not be struck.	Proposed USWTR range are located 44-51 NM from shore, beyond typical right whale habitat. The likelihood of the occurrence of a right whale within the range is very low. During transit to and from the range, Navy vessels travel at a safe speed in accordance with the USCG "Rules of the Road", found here: http://www.navcen.uscg.gov/mwv/navrules/rotr_online.htm. In addition, the proposed mitigation (Subchapter 6.1 and 6.2) greatly reduces the potential for ship strikes.
Citizens Opposing Active Sonar Threats (COAST) / Wray, Russell	NGO-025.82	Mitigation Measures	Right Whale	Vigilance measures should be enacted at all times (not just times listed in Table 6-2) to reduce potential impact on right whales and other endangered species.	These locations and dates are based upon the best available science.
Natural Resources Defense Council (NRDC)	NGO-026.101	Mitigation Measures	Right Whale	Mitigation measures for right whales appear to be generally insufficient and vaguely worded. e.g. "Good visibility" and "slowest speed consistent with mission" are vague and do not indicate that measures will be used in proper conditions.	The Navy does not concur with this statement.

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Natural Resources Defense Council (NRDC)	NGO-026.103	Mitigation Measures	Right Whale	Because of increased risk to right whale mother+calves on Site A, operations should be suspended from Nov-May.	The Navy is consulting with the NMFS regarding North Atlantic right whale critical habitat. The proposed Jacksonville range, at the closest point, is approximately 50 NM from the coast, 35 NM beyond the east border of the right whale critical habitat. The Navy cannot seasonally restrict the training due to the need to train year-round in order to meet the worldwide deployment schedule. Data shows that right whale mother-calf pairs generally stay within 10 NM of the coast.
Natural Resources Defense Council (NRDC)	NGO-026.104	Mitigation Measures	Right Whale	Use of right whale mitigation limited to critical habitat + 5 NM is inappropriate, as whales may still be present outside of critical habitat. No data has been collected to dismiss right whale occurrence outside the established habitat.	The Navy acknowledges that individuals may occur in other locations, but the primary distribution of species in observed areas is based on the best available data.
Natural Resources Defense Council (NRDC)	NGO-026.105	Mitigation Measures	Right Whale	Passive acoustic detection and reduced ship speeds are critical mitigation factors, and must be considered for all sites.	Passive detection and safe ship speed are used at all times.
Natural Resources Defense Council (NRDC)	NGO-026.106	Mitigation Measures	Right Whale	Even outside of calving season, right whales may be in transit or be in atypical locations. Mitigation measures should be considered for expanded areas and seasons.	The Navy acknowledges that individuals may occur in other locations, but the primary distribution of species in observed areas is based on the best available data.

Name/Agency	Letter Number	Comment Category	Comment Subcategory	Comments	Response
Natural Resources Defense Council (NRDC)	NGO-026.45	Mitigation Measures	Right Whale	Installation should not occur during calving or nursing season.	This period will be avoided as presented in Subchapter 6.4.
Natural Resources Defense Council (NRDC)	NGO-026.46	Mitigation Measures	Right Whale	DEIS should enumerate and discuss collision records, including ones where the Navy was responsible, to assess mitigation measures.	Please refer to Subchapter 4.2.4.4 for a discussion of ship strikes. The Navy is consulting with NMFS under Section 7 of the ESA, and will coordinate under MMPA, regarding impacts to marine mammals and will be implementing required mitigation measures.
Natural Resources Defense Council (NRDC)	NGO-026.47	Mitigation Measures	Right Whale	Assessment of risk of entanglement not realistic given scarce distribution information and ineffective lookouts.	The Navy does not concur with this statement.
Booher, Sam	P-040.3	Mitigation Measures	Right Whale	National Commission study said that the Jacksonville alternative should not be used from mid-Oct to mid-Apr when right whale calves are born.	Navy needs to train year-round to support worldwide deployment schedules. See Subchapter 1.2 for need to train, see Chapter 6 for additional mitigation measures to protect calving right whales.

Name/Agency	Letter Number	Comment Category	Comment Subcategory	Comments	Response
GA Dept of Natural Resources (GADNR) / Holcomb, Noel	S-018.9	Mitigation Measures	Right Whale	The right whale-specific vessel mitigation measures in the DEIS/OEIS would apply only to the Southeast U.S. critical habitat and an adjacent 5 NM-wide 'associated area of concern.' Right whales inhabit a much larger area than this. Research has shown that right whales utilize most waters within 30 nautical miles of the Georgia and northeast Florida. As stated above, right whales may also utilize waters beyond 30 NM of shore; further research is needed to address this question. Right whale-specific mitigation measures should apply to all areas inhabited by right whales--not just the currently delineated Southeast U.S. critical habitat.	The specific mitigation measures for USWTR will be developed in coordination and in consultation with National Marine Fisheries Service.

Name/Agency	Letter Number	Comment Category	Comment Subcategory	Comments	Response
FL Fish and Wildlife Conservation Commission (FFWCC) / Poole, Mary Ann	S-021.7	Mitigation Measures	Right Whale	We recommend that the Navy make seasonal adjustments to the types and number of training scenarios. Exercises could be limited during the peak of calving season (December through March). At a minimum, the number of surface ships that must transit between Mayport and Site A should be reduced during this critical four-month period.	The Navy needs to train year-round to support worldwide deployment schedules. Please refer to Subchapter 1.2 for the need to train. In addition, Chapter 6 addresses additional mitigation measures to protect calving right whales.
FL Fish and Wildlife Conservation Commission (FFWCC) / Poole, Mary Ann	S-021.8	Mitigation Measures	Right Whale	We recommend that all Navy vessels transiting to or from Mayport and Site A should reduce speeds below the 15 to 17 knots reported as typical Navy ship transit speeds to reduce the risk of fatal collisions with right whales. The NMFS recently issues a ship speed rule (NMFS 2008) establishing a limit of 10 knots for non-exempt vessels and asking Federal vessels to voluntarily observe the rule when and where their missions would not be compromised.	Navy vessels travel at a slow, safe speed in accordance with the U.S. Coast Guard "Rules of the Road," found at http://www.navcen.uscg.gov/mwv/navrules/rotr_online.htm. NMFS exempts military vessels from the these speed restrictions due to mitigation measures previously negotiated, such as those identified in Chapter 6 of the USWTR EIS. In addition, the Navy supports the Early Warning System (EWS) for the North Atlantic right whale during the calving season in the Southeast as part of the Section 7 consultation with NOAA completed in 1997. The EWS consists of a communication network and aerial surveys that assist afloat commands to avoid North Atlantic right whale strikes in the Jacksonville/Charleston Operating Areas.

Name/Agency	Letter Number	Comment Category	Comment Subcategory	Comments	Response
FL Fish and Wildlife Conservation Commission (FFWCC) / Poole, Mary Ann	S-021.9	Mitigation Measures	Right Whale	Navy aircraft transiting between shore and Site A (and passing over critical habitat) should maintain a maximum feasible altitude to reduce potential impacts to right whales. Non-exempted civilian aircraft are prohibited from intentionally approaching within 460 m of any right whale (NMFS 2004) and we suggest transiting Navy aircraft maintain a distance of 460 m (500 yards) whenever possible. When they occur, right whale sightings and any observed behavioral reactions to passing aircraft should be documented and reported to the Early Warning System (EWS) network.	Mitigation was developed through Section 7 consultation with NMFS and the regulations at 50 C.F.R. § 224.103(c)(3)(i), "Special Prohibitions for Marine Mammals" (please refer to Subchapter 4.3.10, "Aircraft Noise"). In addition, all sightings of right whales during calving season are reported to the Early Warning System, as detailed in Subchapter 3.2.6.1.

Name/Agency	Letter Number	Comment Category	Comment Subcategory	Comments	Response
FL Fish and Wildlife Conservation Commission (FFWCC) / Poole, Mary Ann	S-021.10	Mitigation Measures	Right Whale	We recommend that the Navy assist in funding research on satellite tag technology that would improve the knowledge base of the migratory patterns and behaviors of right whales along the eastern U.S. seaboard. As noted previously, timing of migration is variable among years and is influenced by a number of environmental factors. The offshore extent of right whale migration, and influencing factors, are also poorly known. Satellite tagging of right whales would provide valuable information on migratory behavior that is difficult to obtain through traditional means, such as vessel or aerial studies, and would reduce uncertainty of right whale presence at the proposed USWTR.	The National Marine Fisheries Service does not generally allow the tagging of endangered species due to the possibility of injury. The Navy takes part in the Right Whale Early Warning System, a collaborative effort to track right whales through comprehensive aerial surveys conducted during the right whale calving season, with the goal of reducing the likelihood of ship strikes (please refer to Subchapter 3.2.6.1).

Name/Agency	Letter Number	Comment Category	Comment Subcategory	Comments	Response
FL Fish and Wildlife Conservation Commission (FFWCC) / Poole, Mary Ann	S-021.11	Mitigation Measures	Right Whale	Navy protocols for detecting right whales and other cetaceans call for shipboard and/or aerial observers and passive listening for detecting right whales and other marine mammals. The amount of dive time in conjunction with weather/visibility issues, however, will limit the ability of observers to detect marine mammals. From a ship, right whales can be more difficult to identify than other cetaceans because they lack a dorsal fin. Aural detection requires that animals are vocalizing. Little is currently known about the vocalization of diving behavior of right whales on migration or on the calving grounds; therefore the existing Navy protocols offer essential but not optimal protections.	The Navy has developed their mitigation measures in coordination with the National Marine Fisheries Service, a cooperating agency on the EIS. Mitigation effectiveness is discussed in Chapter 6 of the DEIS.

Name/Agency	Letter Number	Comment Category	Comment Subcategory	Comments	Response
Ocean Conservancy / Koelsch, Jessica	NGO-006.2	Mitigation Measures	Sea Turtle	Construction activities should be suspended during turtle nesting season.	Please refer to Subchapters 4.6.3 and 6.3. There could be temporary impacts to the nesting activities of the loggerhead sea turtle, green sea turtle, and leatherback sea turtle if installation occurs during nesting months. Under such circumstances, consultation with the USFWS would be conducted before initiating any construction activities.
Duke Environmental Law & Policy Clinic	NGO-012.30	Mitigation Measures	Sea Turtle	Consultation with USFWS is not sufficient description on proposed mitigation procedures. The DEIS should include analysis of effectiveness of procedures.	In addition to consulting with USFWS, should construction coincide with sea turtle nesting season, conservation measures are in place at Camp Lejeune and Naval Station Mayport to reduce or eliminate impacts to sea turtles. The beach would not be disturbed due to horizontal directional drilling of an conduit beneath the beach, direct impact will be avoided. Please refer to Subchapters 4.6 and 6.3 for more information.
Duke Environmental Law & Policy Clinic	NGO-012.36	Mitigation Measures	Sea Turtle	Urges laying transmission cables and junction box outside of turtle nesting and hatching season.	Comment noted. Turtle nesting areas will be avoided through use of horizontal directional drilling of a conduit under dune and beach habitats. If installation occurs during nesting months, consultation with the USFWS would be conducted before initiating any construction activities.

Name/Agency	Letter Number	Comment Category	Comment Subcategory	Comments	Response
Duke Environmental Law & Policy Clinic	NGO-012.37	Mitigation Measures	Sea Turtle	Urges suspension of training during the peak of hatching season to avoid interference with hatchling navigation	Please refer to 4.2.4.1. The fiber optic cables being utilized have a significantly smaller electromagnetic footprint and subsequent impact. The EMF produced by the cable is less than that of the earth at any distance beyond 1/4 inch. Given the large distance between the cables and sea turtles, it is extremely unlikely that they will be affected. All efforts are made to reduce any impacts to sea turtles. The Navy has consulted with NMFS, and may consult with USFWS regarding impacts to sea turtles within the range.
Duke Environmental Law & Policy Clinic	NGO-012.38	Mitigation Measures	Sea Turtle	Urges use of aerial detection of Sargassum to avoid dropping sonobuoys on mats (to reduce potential of impact to turtle juveniles).	Comment noted. Helicopters will survey the vicinity for 10 minutes before dropping sonoboys. The Navy coordinated with NMFS regarding mitigation measures.
Duke Environmental Law & Policy Clinic	NGO-012.40	Mitigation Measures	Sea Turtle	Urges financial support of studies and monitoring of in-water populations of juvenile and adult sea turtles.	Comment noted.

Name/Agency	Letter Number	Comment Category	Comment Subcategory	Comments	Response
Cetacean Society International / Rossiter, William	NGO-014.12	Mitigation Measures	Sea Turtle	Visual and acoustic detection is unrealistic for turtles, as loggerheads essentially hibernate at great depth for long periods - undetectable to passive sonar, but affected by active sonar.	Methods of monitoring sea turtles (including visual and acoustic detection) are NMFS-approved methodologies. While passive listening is used primarily for detecting vocalizing animals, this technology is incorporated into D-tags which can be used to track sea turtles and determine the levels of ambient noise and other sounds which they are exposed to. The Navy does not anticipate any impacts to sea turtles from the use of sonar. Please see Subchapter 3.3.2.3 for a summary of existing data on sea turtle hearing.
Southern Environmental Law Center / Wannamaker, Catherine M.	NGO-017.47	Mitigation Measures	Sea Turtle	Insufficient detail of mitigation of landfall activities, and no attempt to analyze proposed mitigation effectiveness.	Mitigation procedures related to landside construction activities are outlined in Subchapters 4.6 and 6.3. As part of the Integrated comprehensive Monitoring Program (ICMP), all mitigation measure effectiveness will be analyzed and evaluated to promote adaptive management strategies.
Southern Environmental Law Center / Wannamaker, Catherine M.	NGO-017.58	Mitigation Measures	Sea Turtle	Passive listening is not effective for non-vocalizing animals, including pinnipeds and sea turtles.	Comment noted. While passive listening focuses on the detection of vocalizing animals, passive acoustics technology is incorporated in D-tags and can be used to assess the level of ambient noise and other sounds sea turtles experience in their environment.

Name/Agency	Letter Number	Comment Category	Comment Subcategory	Comments	Response
Southern Environmental Law Center / Wannamaker, Catherine M.	NGO-017.61	Mitigation Measures	Sea Turtle	Cable installation moratorium during right whale calving season doesn't mitigate impact to EFH and turtles	Comment noted. The Navy will implement recommended mitigation measures resulting from consultation with NMFS concerning impacts to EFH and sea turtles.
Southern Environmental Law Center / Wannamaker, Catherine M.	NGO-017.69	Mitigation Measures	Sea Turtle	Navy should avoid use of sonar and dropping of parachutes when turtles are detected. Especially important during fall-winter, when turtles amass offshore.	The best available science indicates that turtles cannot perceive mid-frequency active sonar; see Subchapter 3.3.2.3.
Earthjustice / Renshaw, Katie	NGO-019.7	Mitigation Measures	Sea Turtle	re: 6-22: Observers are limited, and cannot detect buried animals or physically remove animals from harm's way.	Comment noted.

Name/Agency	Letter Number	Comment Category	Comment Subcategory	Comments	Response
Citizens Opposing Active Sonar Threats (COAST) / Wray, Russell	NGO-025.58	Mitigation Measures	Sea Turtle	If installation occurs during brumanation, turtles may not move out of the way.	Few studies examine whether or not sea turtles exhibit true hibernation behavior. Carr et al. (1980) reported torpid loggerhead turtles in the ship channel near Cape Canaveral in the winter of 1978. The turtles were mud-coated which suggests they were dug-in and fisherman in the area attested to hibernation in this species. Further attempts to locate hibernating turtles in the same area and in similar locations along the GA and SC coasts have produced no torpid turtles. While these field observations merit further study, there is not yet evidence that sea turtles can tolerate prolonged submergence, such as is suggested by "digging-in" behavior (Ultsch, 2006). Neither loggerheads or Kemps are tolerant of cold water, and there are frequent reports of cold stunning of these species. Furthermore, results from the limited investigations on the subject indicate that sea turtles do not exhibit activity that qualifies as hibernation (Moon et al., 1997). The Navy has consulted with NMFS, and may consult with USFWS, regarding impacts to sea turtles within the range.
Nowlin, Michelle	P-035.6	Mitigation Measures	Sea Turtle	Posting of observers won't mitigate impacts to sea turtles, who are underwater roughly 90% of the time.	No significant impacts to sea turtles are anticipated.

Name/Agency	Letter Number	Comment Category	Comment Subcategory	Comments	Response
Nowlin, Michelle	P-035.7	Mitigation Measures	Sea Turtle	Sea turtle juveniles are obscured by Sargassum grass, making Navy observers much less effective.	Comment noted. The Navy coordinated with NMFS as to mitigation measures to further protect marine life.
Nowlin, Michelle	P-035.8	Mitigation Measures	Sea Turtle	Mitigation section is deficient, as it does not respond to measures recommended in response to the 2005 DEIS, including: timing construction outside of turtle nesting and migration season, providing turtle density estimates, complete mapping of range area prior to construction, use of biodegradable parachutes, slower ship speeds, and recovery of spent material.	Comments previously submitted to the 2005 USWTR EIS were considered in the preparation of the 2008 draft EIS. All efforts are made to reduce or eliminate impacts to natural resources. If construction does occur during sea turtle nesting season, USFWS will be consulted to prior to construction proceeding. Sea turtle density estimates are outlined in the Navy's NODE report (2007 - available on USWTR public Web site), in which densities were calculated using aerial survey data provided by the NMFS-NEFSC and the NMFS-SEFSC. Maps for all alternatives are included in the EIS, and more detailed representations will be included in future versions of the document. The Navy coordinated with NMFS regarding all potential impacts to marine mammals and sea turtles.
NASA / Campbell, John H.	F-002.5	NEPA Compliance	Agency Coordination	Offer to rewrite/co-write Subchapters 4.4.1.4 and 4.8.3.10 to ensure accuracy.	The Navy has met with NASA regarding their concerns.

Name/Agency	Letter Number	Comment Category	Comment Subcategory	Comments	Response
Minerals Management Service (MMS) / Oynes, Chris C.	F-003.7	NEPA Compliance	Agency Coordination	Request consultation to analyze areas and coordinate installation as to not interfere with any MMS activities.	The Navy will coordinate with the MMS, but use of the area of the range for MMS activities would be incompatible.
Minerals Management Service (MMS) / Oynes, Chris C.	F-003.8	NEPA Compliance	Agency Coordination	Requests that USWTR areas be made available for MMS activities.	The Navy will coordinate with the MMS, but use of the area of the range for MMS activities would be incompatible.
USEPA / Mueller, Heinz J.	F-005.3	NEPA Compliance	Agency Coordination	FEIS should document consultation record with USFWS and NOAA Fisheries as part of compliance with the ESA, MMPA, and MSA.	Please refer to revised text in Subchapter 1.6 detailing the process of consultation, concerning USWTR, between the Navy and these agencies.
Duke Environmental Law & Policy Clinic	NGO-012.42	NEPA Compliance	Agency Coordination	DEIS contains no specific information on 'consulting with NMFS' - when will it take place, and what will it entail?	Coordination has begun with NMFS and will continue, under NEPA, in the preparation of this EIS. NMFS is a cooperating agency. The Navy will request authorization from NMFS under Section 7 of ESA and MMPA.
Natural Resources Defense Council (NRDC)	NGO-026.144	NEPA Compliance	Agency Coordination	Conflicts of USWTR with other agencies and land-use policies must be considered.	Coordination has been conducted and policies will be considered. All required authorizations will be obtained.

Name/Agency	Letter Number	Comment Category	Comment Subcategory	Comments	Response
Booher, Sam	P-040.10	NEPA Compliance	Agency Coordination	Managers from SC, GA, and FL Federal Waters were not invited to a meeting, outlining training procedures, between US Fleet Forces Command & MAFMC.	Comment noted.
South Carolina Department of Natural Resources / Perry, Robert D.	S-001.3	NEPA Compliance	Agency Coordination	SCDNR requests continued coordination on preparation of the FEIS. Contact Susan Davis @ 843-953-9003 or daviss@dnr.sc.gov	The Navy will continue to coordinate with the SCDNR.
North Carolina Division of Marine Fisheries (NCDMF) / Duval, Michelle	S-006.1	NEPA Compliance	Agency Coordination	Even if Jacksonville alternative is selected, NCDMF resources could be impacted due to inter-jurisdictional nature of fisheries resources.	The Navy will continue to coordinate with the NCDMF.
North Carolina Department of Environment and Natural Resources (NCDENR) / McGee, Melba	S-007.1	NEPA Compliance	Agency Coordination	If NC becomes the preferred location, ask that NCDENR be able to review that revised DEIS.	North Carolina DENR has been given the opportunity to review the EIS and will continue to be allowed to do so.
Virginia Department of Environmental Quality (VADEQ) / Irons, Ellie	S-009.1	NEPA Compliance	Agency Coordination	State of Virginia has no objection to the proposal if VACAPES site selected.	Comment noted.

Name/Agency	Letter Number	Comment Category	Comment Subcategory	Comments	Response
VADEQ Div of Air Program Coordination	S-011.1	NEPA Compliance	Agency Coordination	List of VA pollution control board regulations that may apply to construction and operation of USWTR.	Comment noted. If VA site is selected, the Navy will comply with all applicable regulations.
Virginia Marine Resources Commission (VAMRC) / Badger, George H., III	S-012.1	NEPA Compliance	Agency Coordination	Permit from VAMRC required for any activities that encroach on (or over) material of beds of bays, oceans, rivers, stream or creeks of VA. VACAPES alternative will require such a permit, according to proposal.	Comment noted.
Virginia Department of Conservation and Recreation (VADCR) / Munson, Robert S.	S-014.1	NEPA Compliance	Agency Coordination	Coordinate with USFWS, VA Dept of Game and Inland Fisheries, and NMFS regarding impacts to sea turtles (including endangered loggerhead sea turtle - which is in vicinity of VACAPES range) and marine mammals.	Comment noted.
Virginia Department of Conservation and Recreation (VADCR) / Munson, Robert S.	S-014.2	NEPA Compliance	Agency Coordination	Although no other species or reserves impacted, VADCR should be contacted if a significant amount of time passes before installation. VA Dept. of Game and Inland Fisheries maintains a database of wildlife locations at: www.dgif.virginia.gov/wildlifeinfo_map/index.html	Comment noted. If VA site is selected we will coordinate with VDCR.

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VA Dept of Game and Inland Fisheries (VDGIF) / Ewing, Amy	S-015.4	NEPA Compliance	Agency Coordination	Include impacts on state-listed species as well. For VACAPES, coordinated with VDGIG, VDCR-DNH, and VDACS.	Comment noted. If VA site is selected, the Navy will coordinate with VDGIF.
VADEQ Waste Division / Herman, Paul E.	S-017.3	NEPA Compliance	Agency Coordination	Prior to initiation installation of communication facility on Wallops Island - contact T.J. Mayers (757-824-1987) at NASA & Sher Zaman (410-962-3134) at USACE.	Comment noted
NASA / Campbell, John H.	F-002.4	NEPA Compliance	Alternatives Analysis	Recommend adjusting Site D northward to not directly conflict with NASA's Wallops airspace.	Please refer to Chapter 2 for discussion of the site selection process. Conflict with NASA's Wallops airspace is being considered in the EIS and coordination with NASA staff will be conducted if Alternative site D is selected as the preferred site.
Minerals Management Service (MMS) / Oynes, Chris C.	F-003.1	NEPA Compliance	Alternatives Analysis	VACAPES alternative is close to proposed Virginia oil and gas lease sale area.	VACAPES USWTR alternative does not conflict with area.
Minerals Management Service (MMS) / Oynes, Chris C.	F-003.2	NEPA Compliance	Alternatives Analysis	High energy geophysical surveys (for likely exploration or research) may impact transducers.	High energy surveys proposed by MMS in the vicinity of USWTR would need to be coordinated with the Navy.

Name/Agency	Letter Number	Comment Category	Comment Subcategory	Comments	Response
Minerals Management Service (MMS) / Oynes, Chris C.	F-003.3	NEPA Compliance	Alternatives Analysis	USWTR may impact future use of sand and gravel for beach restoration.	There may be an impact but the trunk cable would cover a very small footprint.
Minerals Management Service (MMS) / Oynes, Chris C.	F-003.4	NEPA Compliance	Alternatives Analysis	USWTR cables may cross MMS borrow areas (current or future), interaction more likely with Jacksonville alternative.	There may be an impact but the trunk cable would cover a very small footprint.
Minerals Management Service (MMS) / Oynes, Chris C.	F-003.5	NEPA Compliance	Alternatives Analysis	NC, SC alternatives would cover known seafloor mineral deposits (Mn crusts on Blake Plateau, and phosphate deposits on Onslow Bay).	There would be an a small area impacted by the USWTR instrumentation.
Minerals Management Service (MMS) / Oynes, Chris C.	F-003.6	NEPA Compliance	Alternatives Analysis	USWTR may impact future installation of wind farms if technical limits of depth are overcome (no alternative listed as more likely to impact).	There would be a small area impacted by the USWTR instrumentation.
USEPA / Mueller, Heinz J.	F-005.1	NEPA Compliance	Alternatives Analysis	Recommends discussion of reason of change of preferred alternative to JAX from Cherry Point.	Please refer to Subchapter 2.3.4.2.

Name/Agency	Letter Number	Comment Category	Comment Subcategory	Comments	Response
USEPA / Mueller, Heinz J.	F-005.2	NEPA Compliance	Alternatives Analysis	Re: Table 2-6. There appears to be no significant difference between Jacksonville and Charleston - Jacksonville even seems worse due to commercial fisheries and potential environmental impacts (NARW, artificial reefs, more hard bottom). FEIS must support choice of JAX.	Please refer to revised text in Chapter 2.
Office of the Mayor of Jacksonville / McCarthy, Julian	L-001.1	NEPA Compliance	Alternatives Analysis	Supports the USWTR in Jacksonville	Comment noted.
Office of the Mayor of Jacksonville / McCarthy, Julian	L-001.2	NEPA Compliance	Alternatives Analysis	Jacksonville alternative increases utilization of current Navy resources.	Comment noted.
Jacksonville Chamber of Commerce / Haley, John	L-002.2	NEPA Compliance	Alternatives Analysis	Jacksonville alternative is most efficient, and therefore would save public money.	Comment noted.

Name/Agency	Letter Number	Comment Category	Comment Subcategory	Comments	Response
Jacksonville Chamber of Commerce / Haley, John	L-002.3	NEPA Compliance	Alternatives Analysis	USWTR is important for the need to train as you operate. It is difficult to detect submarines in shallow water.	Comment noted.
Ocean Conservancy / Cornish, Vicky	NGO-005.4	NEPA Compliance	Alternatives Analysis	Encourages consideration of sites with less potential to harm wildlife.	Comment noted.
Jacksonville Area Ship Repair Association / Froehlich, Ed	NGO-008.2	NEPA Compliance	Alternatives Analysis	Ideal training includes many types of units, the Jacksonville alternative is ideal for access to these units, making for effective training.	Comment noted.
Cypress Sierra Group / Langrish, Art	NGO-010.1	NEPA Compliance	Alternatives Analysis	Opposes sites off NC, SC, FL due to impacts on sea life. Urges identification of least harmful location(s).	Alternatives are addressed in Chapter 2 and environmental analysis is presented in Chapter 4
Duke Environmental Law & Policy Clinic	NGO-012.44	NEPA Compliance	Alternatives Analysis	Pursuant to consultation guidelines, where there is uncertainty (as there is in USWTR DEIS), the timeline must be altered to allow for data collection to reduce or eliminate the uncertainty; or agency must give 'benefit of doubt' to endangered species.	We are coordinating with NMFS and will consult with USFWS if necessary. The best the available and most applicable science was used to make the assessments in the EIS. See discussion in Chapter 1.

Name/Agency	Letter Number	Comment Category	Comment Subcategory	Comments	Response
Duke Environmental Law & Policy Clinic	NGO-012.45	NEPA Compliance	Alternatives Analysis	USWTR will doubtless have uncertainty, but it cannot be carried out without demonstrating that the action will not jeopardize any species. The Navy has not demonstrated this.	We are coordinating with NMFS and will consult with USFWS if necessary. The best the available and most applicable science was used to make the assessments in the EIS. See discussion in Chapter 1.
Sierra Club (GA Chapter) / Grainey, Karen	NGO-015.2	NEPA Compliance	Alternatives Analysis	If NC alternative was inappropriate due to harm to wildlife, FL is more so, due to right whale.	We are coordinating with NMFS and will consult with USFWS if necessary. The best the available and most applicable science was used to make the assessments in the EIS. See discussion in Chapter 1. The Preferred Alternative was changed due to operational considerations.
Southern Environmental Law Center / Wannamaker, Catherine M.	NGO-017.4	NEPA Compliance	Alternatives Analysis	Navy did not include environmental impact as a criteria for the site selection, failing to satisfy NEPA.	The Navy does not concur with this statement. Anticipated impacts at each alternative site have been evaluated in Chapter 4, and were considered in the selection of Site A. The Navy will obtain the required regulatory approvals from federal agencies before proceeding with construction.
Earthjustice / Renshaw, Katie	NGO-019.1	NEPA Compliance	Alternatives Analysis	NEPA requires meaningful review of alternative methods with less impact, but the DEIS does not seriously consider a true "no-action" alternative.	No Action alternative considers no construction of USWTR in Subchapter 2.5.

Name/Agency	Letter Number	Comment Category	Comment Subcategory	Comments	Response
Earthjustice / Renshaw, Katie	NGO-019.2	NEPA Compliance	Alternatives Analysis	Although the DEIS discusses impacts, it is clear that environmental impacts did not affect the Navy's decision, counter to NEPA requirements.	The Navy does not concur with this statement. Anticipated impacts at each alternative site have been evaluated in Chapter 4, and were considered in the selection of Site A. The Navy will obtain the required regulatory approvals from federal agencies before proceeding with construction.
Sierra Club Florida / Bremer, Linda M.	NGO-021.1	NEPA Compliance	Alternatives Analysis	Opposes Jacksonville alternative due to proximity to right whale calving area.	The EIS presents an in-depth analysis of impacts to the North Atlantic right whale (see Chapter 4). The Navy will undertake additional mitigation measures specific to right whales (see Subchapter 6.2), including suspension of construction during calving season. The preferred USWTR Site A is 50 NM offshore, 30 NM beyond recognized calving grounds. The Navy is coordinating with NMFS about impacts to the right whale from all USWTR activities, in accordance with Section 7 of the ESA. Risk of ship strike is not predicted to increase due to effective mitigation measures (see Subchapter 6.2) and a reduction in homeported vessels at NS Mayport.
Jacksonville Offshore Fishing Club / Kalakauskis, Ed	NGO-022.3	NEPA Compliance	Alternatives Analysis	USWTR would cause less impact to benthic habitat if placed off Georgia.	Please refer to site selection text in Chapter 2 for the criteria that were used to identify and evaluate alternative locations for USWTR.

Name/Agency	Letter Number	Comment Category	Comment Subcategory	Comments	Response
PenderWatch & Conservancy / Anonymous	NGO-024.1	NEPA Compliance	Alternatives Analysis	Urges placement of USWTR away from areas used by threatened species.	Please refer to site selection and operational parameters text within Chapter 2.
Citizens Opposing Active Sonar Threats (COAST) / Wray, Russell	NGO-025.91	NEPA Compliance	Alternatives Analysis	Moving the USWTR to less sensitive areas could avoid beaked whale impacts.	Site selection requires a site at the shelf break. The site selection process described in Subchapter 2.3 discusses why the four alternative locations addressed in the OEIS/EIS are the only locations determined to meet the critical site selection criteria.
Citizens Opposing Active Sonar Threats (COAST) / Wray, Russell	NGO-025.94	NEPA Compliance	Alternatives Analysis	DEIS does not consider alternatives that might be effective in minimizing impact, such as refraining USWTR activities when right whales are reasonably expected to be present.	Please refer to site selection text in Chapter 2 for the criteria that were used to identify and evaluate alternative locations for USWTR. The site selection process described in Subchapter 2.3 discusses why the four alternative locations addressed in the OEIS/EIS are the only locations determined to meet the critical site selection criteria. See Subchapter 6.2 related to protective measures for right whales.
Citizens Opposing Active Sonar Threats (COAST) / Wray, Russell	NGO-025.95	NEPA Compliance	Alternatives Analysis	DEIS appears to only factor in cost and convenience, and does not include environmental impact as a part of analysis.	The Navy does not concur with this statement. Anticipated impacts at each alternative site have been evaluated in Chapter 4, and were considered in the selection of Site A.

Name/Agency	Letter Number	Comment Category	Comment Subcategory	Comments	Response
Natural Resources Defense Council (NRDC)	NGO-026.10	NEPA Compliance	Alternatives Analysis	Navy did not consider the environment until after the Jacksonville alternative had been chosen.	The Navy does not concur with this statement. Anticipated impacts at each alternative site have been evaluated in Chapter 4, and were considered in the selection of Site A.
Natural Resources Defense Council (NRDC)	NGO-026.109	NEPA Compliance	Alternatives Analysis	USWTR site selection should avoid bathymetry and oceanographic features likely to be of high-value for species of concern.	Please refer to Subchapter 2.3. The purpose and need of the project requires conducting exercises in isobaths of 37 - 274 m. The Navy is consulting with NMFS under Section 7 of the ESA, and will coordinate under MMPA, and will implement any additional required mitigation measures.
Natural Resources Defense Council (NRDC)	NGO-026.110	NEPA Compliance	Alternatives Analysis	USWTR should avoid areas with higher modeled takes of particular species, which are indicated in DEIS 3.2 and AFAST DEIS App. D.	Please refer to mitigation measures in Chapter 6. Operational requirements and site selection sections address the site selected. The Navy is consulting with NMFS under Section 7 of the ESA, and will coordinate under MMPA, and will implement any additional required mitigation measures.
Natural Resources Defense Council (NRDC)	NGO-026.124	NEPA Compliance	Alternatives Analysis	USWTR should avoid important habitat for fish and turtles.	The Navy is coordinating with NMFS with regard to EFH and turtle populations and will implement required mitigation measures.
Natural Resources Defense Council (NRDC)	NGO-026.134	NEPA Compliance	Alternatives Analysis	Navy selected a preferred site prior to completion of baseline analyses of marine mammal abundance.	The Navy does not concur with this statement. Anticipated impacts at each alternative site have been evaluated in Chapter 4, and were considered in the selection of Site A.

Name/Agency	Letter Number	Comment Category	Comment Subcategory	Comments	Response
Natural Resources Defense Council (NRDC)	NGO-026.5	NEPA Compliance	Alternatives Analysis	Navy does not explain new alternative selection (versus 2005), nor fully analyzes present alternatives or considers operational alternatives that would cause less impact.	Subchapter 2.3.4 explains the difference in the criteria used for the selection of the alternatives considered in the 2005 DEIS and the 2008 DEIS.
Natural Resources Defense Council (NRDC)	NGO-026.92	NEPA Compliance	Alternatives Analysis	Alternatives were not selected for minimization of impact to the environment, but on non-environmental factors (cost and convenience). Discussion must provide environmental choices for decision makers, but does not, violating NEPA.	Please refer to Chapter 4 for analysis of impacts. NEPA does not require least damaging alternative.
Natural Resources Defense Council (NRDC)	NGO-026.93	NEPA Compliance	Alternatives Analysis	DEIS omits other reasonable alternative sites (e.g. NJ, Gulf of Mexico) without full, quantified explanation.	Please refer to Chapter 2 for site selection criteria.
Natural Resources Defense Council (NRDC)	NGO-026.94	NEPA Compliance	Alternatives Analysis	DEIS doesn't consider using a combination of simulators & at-sea training (reducing the number of exercises, but still providing realistic training).	Please refer to Subchapter 2.1 in the USWTR EIS. The Navy did evaluate other alternatives that were considered but eliminated.
Natural Resources Defense Council (NRDC)	NGO-026.96	NEPA Compliance	Alternatives Analysis	DEIS doesn't consider a reduction the level of training in USWTR, current levels may be an artifact from the Navy's TAP process.	Chapter 2 discusses alternatives and Chapter 1 discusses Purpose and Need.

Name/Agency	Letter Number	Comment Category	Comment Subcategory	Comments	Response
Caruso, William	P-003.6	NEPA Compliance	Alternatives Analysis	Navy could use AUTEC at Fresh Creek, Andros (Bahamas) instead.	AUTEC is a deep water range, whereas USWTR is proposed to be a shallow water range. Sound behaves differently in littoral areas, hence the need for the shallow water range. Chapter 1 discusses Purpose and Need.
Dereszynski, Nyla	P-010.1	NEPA Compliance	Alternatives Analysis	Against using waters off NC for the project.	Comment noted.
Wright, Thomas	P-011.1	NEPA Compliance	Alternatives Analysis	Support for Jacksonville as the alternative.	Comment noted.
Rigney, Dianne	P-013.2	NEPA Compliance	Alternatives Analysis	Encourages other methods of training, besides open water.	Please refer to Subchapter 2.1 in the USWTR EIS. The Navy did evaluate other alternatives that were considered but eliminated.
Berkman, Budd	P-017.2	NEPA Compliance	Alternatives Analysis	Has the Navy contacted marine biologists who are knowledgeable of the area? Please do so before making a decision.	The EIS represents the best available science on the study area. Numerous scientists were consulted in the evaluation of the impacts of the project. The Navy will obtain the required regulatory approvals from federal agencies before proceeding with construction.

Name/Agency	Letter Number	Comment Category	Comment Subcategory	Comments	Response
Matthaei, Julie	P-018.2	NEPA Compliance	Alternatives Analysis	Strongly urges Navy to consider a less sensitive location.	Please refer to site selection text in Chapter 2 for the criteria that were used to identify and evaluate alternative locations for USWTR. The site selection process described in Subchapter 2.3 discusses why the four alternative locations addressed in the OEIS/EIS are the only locations determined to meet the critical site selection criteria.
Pillmore, Patricia J.	P-019.4	NEPA Compliance	Alternatives Analysis	Request that the Navy design a project that would enhance the environment.	Comment noted.
Farr, Kelly	P-022.1	NEPA Compliance	Alternatives Analysis	Urges a different training method or location that does not impact wildlife, specifically migration routes of endangered whales.	Alternative training concepts considered but eliminated from further consideration are discussed in Subchapter 2.1. See Subchapter 4.2.4 regarding the evaluation of impacts to marine mammals.
Johnson, Wayne	P-024.2	NEPA Compliance	Alternatives Analysis	Urges another form of training other than USWTR, due to the history of cetaceans being harmed by similar activities.	Alternative training concepts considered but eliminated from further consideration are discussed in Subchapter 2.1. See Subchapter 4.2.4 regarding the evaluation of impacts to marine mammals.
Asly, Sandy	P-025.2	NEPA Compliance	Alternatives Analysis	Encourages selection of a more remote site, due to proximity of the current alternatives to sea life.	The site selection process, described in Subchapter 2.3, discusses why the four alternative locations addressed in the OEIS/EIS are the only locations determined to meet the critical site selection criteria.

Name/Agency	Letter Number	Comment Category	Comment Subcategory	Comments	Response
Darin, Susan	P-026.1	NEPA Compliance	Alternatives Analysis	Opposes selection of the NC alternative due to the ecological impacts sonar would have on associated essential fish and coral habitat, and marine animal migration paths.	Comment noted. The potential for impact of sonar to coral, fish, and marine mammals are addressed in Subchapter 3.3.2.1, 3.3.2.2 and 3.3.2.4, respectively. Fish and coral are not predicted to be impacted by sonar. Marine Mammals can be impacted by sonar (see Subchapter 4.3 for analysis), but implemented mitigation measures (see Chapter 6) will minimize potential impact. The Navy is consulting with NMFS under Section 7 of the ESA, and will coordinate under MMPA, and will implement any additional required mitigation measures.
Center, Larry Carter	P-028.1	NEPA Compliance	Alternatives Analysis	US Navy should not be trusted with the decision of alternatives.	Comment noted.
Center, Larry Carter	P-028.3	NEPA Compliance	Alternatives Analysis	Urges use of [Pearl Harbor] or selection of a location beyond coastal waters.	The purpose of the proposed action is to enable the Navy to train effectively at a suitable location for the Atlantic Fleet ASW capable units. Please see Subchapter 1.1.
Hass, Marsha	P-030.1	NEPA Compliance	Alternatives Analysis	Opposes Charleston alternative (prefers Jacksonville), as USWTR would wipe out SC recreational fishing areas.	Please refer to Chapter 4.4 for discussion of impacts to fishing. No impact to fish stocks is predicted. Range would never be closed to fishermen.

Name/Agency	Letter Number	Comment Category	Comment Subcategory	Comments	Response
Anonymous	P-031.1	NEPA Compliance	Alternatives Analysis	Opposes Charleston alternative.	Comment noted.
Anonymous	P-032.1	NEPA Compliance	Alternatives Analysis	Opposes current alternative sites due to impact to marine mammals and other sea life.	Comment noted.
Anonymous	P-032.2	NEPA Compliance	Alternatives Analysis	Navy should restrict exercises to areas away from marine mammal sanctuaries or migration routes.	USWTR will not impact any marine mammal sanctuaries.
Thomas, Sean	P-037.2	NEPA Compliance	Alternatives Analysis	DEIS lacks 'information data off the SC coast'.	Best available science on abundance was used in this analysis.
Cross, David and Rita	P-039.2	NEPA Compliance	Alternatives Analysis	Urge an alternative to the currently proposed USWTR plan.	The site selection process described in Subchapter 2.3 discusses why the four alternative locations addressed in the EIS are the only locations determined to meet the critical site selection criteria. Please refer to Chapter 1 for Purpose and Need.

Name/Agency	Letter Number	Comment Category	Comment Subcategory	Comments	Response
Booher, Sam	P-040.11	NEPA Compliance	Alternatives Analysis	Placing the USWTR in GA/FL waters poses more risk to marine mammals than placing it off of NC.	The preferred alternative site (Site A) was selected based upon physiography and operational criteria, see Chapter 2. The evaluation of the environmental impacts of the alternative sites is addressed in Chapter 4.
Booher, Sam	P-040.2	NEPA Compliance	Alternatives Analysis	National Commission study said that north Florida should not be considered due to proximity to right whale calving grounds.	The EIS presents an in-depth analysis of impacts to the North Atlantic right whale (see Chapter 4), and includes additional mitigation measures specific to right whales (see Subchapter 6.2), including suspension of construction during calving season. The preferred USWTR Site A is 30 NM beyond calving grounds. The Navy is consulting with NMFS about impacts to the right whale, in accordance with Section 7 of the ESA.
Booher, Sam	P-040.4	NEPA Compliance	Alternatives Analysis	The needs of USWTR can be met in the Gulf of Mexico.	Extreme tropical weather conditions, competing uses (mainly oil drilling and commercial fishing operations), and long travel times for range users were the factors that caused the Navy not to carry the Gulf of Mexico alternative forward for further analysis.
Hill, David	P-042.5	NEPA Compliance	Alternatives Analysis	USWTR should not be allowed in current form due to marine ecosystem damage.	EIS concluded no significant environmental impact (see Subchapter 4.8.6).

Name/Agency	Letter Number	Comment Category	Comment Subcategory	Comments	Response
Anonymous	P-043.1	NEPA Compliance	Alternatives Analysis	Opposes Charleston alternative, as it will harm fisheries.	The EIS, using the best available and most applicable science, anticipates no adverse effects to fisheries as a result of range activities. Please refer to Subchapter 4.2.2 for predicted ecological impacts to fish populations and Subchapter 4.4 for impacts to fisheries. Development of the range will not restrict access to fishermen.
Andrews, John	P-046.1	NEPA Compliance	Alternatives Analysis	Opposes expanded sonar use off of NC.	Comment noted.
Carey, Doris	P-049.1	NEPA Compliance	Alternatives Analysis	Urges that USWTR range be far from migratory areas and areas of high densities of marine life, due to likely sonar impacts.	Please refer to Chapter 2 and 4.
Dotterer, Carol+Bill+Max	P-050.1	NEPA Compliance	Alternatives Analysis	Opposes USWTR due to its impact on the environment, specifically on the right whale.	The EIS presents an in-depth analysis of impacts to the North Atlantic right whale (see Chapter 4), and includes additional mitigation measures specific to right whales (see Subchapter 6.2), including suspension of construction during calving season. The preferred USWTR Site A is beyond calving grounds. The Navy has consulted with NMFS about impacts to the right whale, in accordance with Section 7 of the ESA.

Name/Agency	Letter Number	Comment Category	Comment Subcategory	Comments	Response
Kivlehan, Milly	P-051.1	NEPA Compliance	Alternatives Analysis	Opposes Jacksonville alternative due to likely impacts of sonar on endangered right whales.	The EIS presents an in-depth analysis of impacts to the North Atlantic right whale (see Chapter 4), and includes additional mitigation measures specific to right whales (see Subchapter 6.2), including suspension of construction during calving season. The preferred USWTR Site A is beyond calving grounds. The Navy has consulted with NMFS about impacts to the right whale, in accordance with Section 7 of the ESA.
Willard, Wayne	P-053.1	NEPA Compliance	Alternatives Analysis	Opposes Jacksonville alternative due to likely impacts of sonar on endangered right whales.	The EIS presents an in-depth analysis of impacts to the North Atlantic right whale (see Chapter 4), and includes additional mitigation measures specific to right whales (see Subchapter 6.2), including suspension of construction during calving season. The preferred USWTR Site A is beyond calving grounds. The Navy has consulted with NMFS about impacts to the right whale, in accordance with Section 7 of the ESA.
Hall, Katrina W.	P-054.1	NEPA Compliance	Alternatives Analysis	Opposes Jacksonville alternative due to likely impacts of sonar on endangered right whales.	The EIS presents an in-depth analysis of impacts to the North Atlantic right whale (see Chapter 4), and includes additional mitigation measures specific to right whales (see Subchapter 6.2), including suspension of construction during calving season. The preferred USWTR Site A is beyond calving grounds. The Navy has consulted with NMFS about impacts to the right whale, in accordance with Section 7 of the ESA.

Name/Agency	Letter Number	Comment Category	Comment Subcategory	Comments	Response
Boldt, Marjorie A.	P-055.1	NEPA Compliance	Alternatives Analysis	Opposition of USWTR, claiming that it will cause environmental damage with little gain.	The Navy does not concur with this statement. Please refer to Chapter 1 for the need and purpose to effectively train. Anticipated environmental impacts have been evaluated in the EIS; refer to Chapter 4 for discussion of environmental impacts, and Chapter 6 for measures mitigating these impacts.
Souderbark, Tom	P-056.1	NEPA Compliance	Alternatives Analysis	Opposes USWTR due to impact on the environment.	Please refer to Chapter 4. The anticipated impact of USWTR on the environment have been coordinated with federal and state regulatory agencies.
Shields, Brenda	P-060.4	NEPA Compliance	Alternatives Analysis	Why does the Navy prefer Jacksonville now, when it preferred NC before?	The location of the preferred alternative was changed to the Jacksonville USWTR (Site A) due to changes in operations (helicopter squadrons moved to Jacksonville) that resulted in the need to reevaluate alternative sites.
Tuohy, Matthew W.	P-061.1	NEPA Compliance	Alternatives Analysis	Jacksonville alternative is ideal. Efficient access to an area free of major shipping means more efficient use of resources by the Navy.	Comment noted.
Meserve, John	P-062.1	NEPA Compliance	Alternatives Analysis	Jacksonville ideal due to access of facilities that are already present in Mayport.	Comment noted.

Name/Agency	Letter Number	Comment Category	Comment Subcategory	Comments	Response
Meserve, John	P-062.2	NEPA Compliance	Alternatives Analysis	Jacksonville ideal due to better weather conditions (versus other alternatives), and less travel time.	Comment noted.
Bonner, Teresa	P-065.3	NEPA Compliance	Alternatives Analysis	Opposes USWTR due to effect on migrating whales.	Mitigation measures related to whales are addressed in Subchapters 6.1 and 6.2.
Tobias, Dianne K.	P-067.1	NEPA Compliance	Alternatives Analysis	Opposes USWTR in its current form due to impacts on marine environment and wildlife.	Impacts to the marine environment and wildlife are addressed in Subchapter 4.2. Mitigation measures are addressed in Chapter 6.
Brown, Mary L.	P-068.2	NEPA Compliance	Alternatives Analysis	Opposes use of sonar off NC and FL coasts due to impact to marine life.	Impacts to the marine environment and wildlife are addressed in Subchapter 4.2. Mitigation measures are addressed in Chapter 6.
Moore, Gary D., P.H.G.	P-070.1	NEPA Compliance	Alternatives Analysis	Opposes Jacksonville Alternative.	Comment noted.

Name/Agency	Letter Number	Comment Category	Comment Subcategory	Comments	Response
ten Hulzen, Kalinke	P-072.4	NEPA Compliance	Alternatives Analysis	Navy should consider a less sensitive location.	The site selection process described in Subchapter 2.3 discusses why the four alternative locations addressed in the OEIS/EIS are the only locations determined to meet the critical site selection criteria.
Matthaei, Carl & Marcella	P-074.1	NEPA Compliance	Alternatives Analysis	Opposed to placing USWTR in migration path of right whale and humpback whale.	The site selection process described in Subchapter 2.3 discusses why the four alternative locations addressed in the OEIS/EIS are the only locations determined to meet the critical site selection criteria. Please refer to Subchapters 6.1 and 6.2 for mitigation measures to minimize risk to marine mammals.
Witter, William & Matthaei, Maru	P-075.1	NEPA Compliance	Alternatives Analysis	Opposed to placing USWTR in migration path of right whale and humpback whale.	The site selection process described in Subchapter 2.3 discusses why the four alternative locations addressed in the OEIS/EIS are the only locations determined to meet the critical site selection criteria. Please refer to Subchapters 6.1 and 6.2 for mitigation measures to minimize risk to marine mammals.
Davis, Susan	P-076.3	NEPA Compliance	Alternatives Analysis	USWTR site should avoid sensitive whale habitats.	The site selection process described in Subchapter 2.3 discusses why the four alternative locations addressed in the OEIS/EIS are the only locations determined to meet the critical site selection criteria. Please refer to Subchapters 6.1 and 6.2 for mitigation measures to minimize risk to marine mammals.

Name/Agency	Letter Number	Comment Category	Comment Subcategory	Comments	Response
De Van, Dru	P-077.1	NEPA Compliance	Alternatives Analysis	Recommends locating USWTR range in a dead zone, such as Chesapeake Bay, Long Island Sound, LA/TX dead zones.	The site selection process described in Subchapter 2.3 discusses why the four alternative locations addressed in the OEIS/EIS are the only locations determined to meet the critical site selection criteria.
Ray, Janisse	P-080.1	NEPA Compliance	Alternatives Analysis	Opposes Jacksonville alternative due to impact on right whale.	The site selection process described in Subchapter 2.3 discusses why the four alternative locations addressed in the OEIS/EIS are the only locations determined to meet the critical site selection criteria. Please refer to Subchapter 6 for mitigation measures to minimize risk to right whales, including specific measures to be taken while traversing right whale critical habitat (Subchapter 6.2).
Serfass, Linda	P-081.3	NEPA Compliance	Alternatives Analysis	Urges selection of less sensitive habitat.	The site selection process described in Subchapter 2.3 discusses why the four alternative locations addressed in the OEIS/EIS are the only locations determined to meet the critical site selection criteria.
Ramsay, Debra A.	P-082.1	NEPA Compliance	Alternatives Analysis	Opposes Jacksonville alternative unless conclusive evidence is presented that there will be no harm to marine mammals.	The site selection process described in Subchapter 2.3 discusses why the four alternative locations addressed in the OEIS/EIS are the only locations determined to meet the critical site selection criteria. Please refer to Subchapter 6 for mitigation measures to minimize risk to right whales, including specific measures to be taken while traversing right whale critical habitat (Subchapter 6.2).

Name/Agency	Letter Number	Comment Category	Comment Subcategory	Comments	Response
Edward, Sue	P-085.1	NEPA Compliance	Alternatives Analysis	Favors no build alternative due uncertainty of impact of USWTR in right whale habitat and migration route.	The no action alternative would not satisfy the need for the project. Please see Subchapter 2.5.5.
Carter, Larry	P-088.3	NEPA Compliance	Alternatives Analysis	Suggests conducting training in Hawaii due to 'better coastal issues', and not much vulnerable habitat.	The purpose of the proposed action is to enable the Navy to train effectively at a suitable location for the Atlantic Fleet ASW capable units. Please see Subchapter 1.1.
Kirkwood, Jennifer	P-090.1	NEPA Compliance	Alternatives Analysis	Against using waters off NC for the project due to right whale migration. Urges consideration of a less sensitive location.	The EIS presents an in-depth analysis of impacts to the North Atlantic right whale (see Chapter 4), and includes additional mitigation measures specific to right whales (see Subchapter 6.2), including suspension of construction during calving season. The preferred USWTR Site A is beyond calving grounds. The Navy is consulting with NMFS about impacts to the right whale, in accordance with Section 7 of the ESA.
Haberkorn, Donald	P-092.1	NEPA Compliance	Alternatives Analysis	Urges no use of sonar in the natural environment.	Comment noted. Please refer to Chapter 1 for explanation of the need for an instrumented range.

Name/Agency	Letter Number	Comment Category	Comment Subcategory	Comments	Response
Burroughs, Karen	P-093.2	NEPA Compliance	Alternatives Analysis	Opposes Jacksonville alternative. Urges a less harmful location of USWTR.	Comment noted.
Clark, Donna	P-095.1	NEPA Compliance	Alternatives Analysis	Urges a less harmful method of testing sonar.	Comment noted. Please refer to Chapter 1.
Raynor, Andy	P-099.1	NEPA Compliance	Alternatives Analysis	Urges a less harmful method for developing sonar.	Comment noted. Please refer to Chapter 1 for explanation of the purpose and need for an instrumented range.
Roberts, Mary	P-102.1	NEPA Compliance	Alternatives Analysis	Against Jacksonville alternative due to impact on marine life, particularly the right whale.	Impacts to the marine environment and wildlife are addressed in Subchapter 4.2. Mitigation measures related to the right whale are addressed in Subchapter 6.2.
Gerardi, Jane	P-103.1	NEPA Compliance	Alternatives Analysis	Against Jacksonville alternative due to impact on marine life, including long-term impacts. Urges finding a less sensitive area.	Please refer to site selection text in Chapter 2 for the criteria that were used to identify and evaluate alternative locations for USWTR. The site selection process described in Subchapter 2.3 discusses why the four alternative locations addressed in the OEIS/EIS are the only locations determined to meet the critical site selection criteria.

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VA Dept of Mines, Minerals and Energy / Heller, Matthew	S-016.1	NEPA Compliance	Alternatives Analysis	Ch. 4 should consider the potential impact of USWTR on future exploration for and extraction of hard mineral, oil and gas resources. Range appears to be outside current oil and gas lease area for VA.	Comment noted. The only site alternative in the vicinity of the DOI-designated area for drilling in Federal waters on the OCS is shown on Figure 3.4-1: Outer Continental Shelf Oil and Gas Leasing Program Area: 2007-2012. As shown on this figure, USWTR Site D would avoid this area.
FL Fish and Wildlife Conservation Commission (FFWCC) / Poole, Mary Ann	S-021.1	NEPA Compliance	Alternatives Analysis	We recognize and support the need for the proposed training for national security; however, based on the endangered status of the right whale and the importance of protecting their habitat along the U.S. eastern coast, our preferred alternative for this project is the 'No Action' alternative.	Comment noted. The Navy needs to train as it fights (see Chapter 1). Potential impacts to North Atlantic right whale are analyzed in depth in Chapter 4 (concluding no injurious takes due to USWTR). Additional mitigation measures, specific to right whales, are discussed in Subchapter 6.2.
FL Fish and Wildlife Conservation Commission (FFWCC) / Poole, Mary Ann	S-021.2	NEPA Compliance	Alternatives Analysis	Should the USWTR project move forward and one of the four proposed sites is selected, we strongly recommend against Site A (offshore Jacksonville) because of its proximity to the right whale calving grounds and possible negative impacts, including an anticipated increase in traffic through critical habitat.	Comment noted. The Navy needs to train as it fights (see Chapter 1). No additional traffic (over current levels) through critical habitat is anticipated. Potential impacts to North Atlantic right whale are analyzed in depth in Chapter 4 (concluding no injurious takes due to USWTR). Additional mitigation measures, specific to right whales, are discussed in Subchapter 6.2.

Name/Agency	Letter Number	Comment Category	Comment Subcategory	Comments	Response
Natural Resources Defense Council (NRDC)	NGO-002.1	NEPA Compliance	Comment Period Extension	Request for extension of comment period to January 15, 2009 due to the size and complexity of document.	After careful consideration, the Navy made the decision not to extend the public comment period. This decision was made after evaluating the extension requests against the requirements under NEPA. Adherence to the project timeline will ensure that the Navy can meet the planned dates for the publication of the Final OEIS/EIS in May 2009 and the Record of Decision in the Summer 2009.
Lynch & Eatman, LLP	NGO-003.1	NEPA Compliance	Comment Period Extension	Asks for comment period to be extended, given the severity of the issue, the information lacking, and the size of the DEIS document.	After careful consideration, the Navy made the decision not to extend the public comment period. This decision was made after evaluating the extension requests against the requirements under NEPA. Adherence to the project timeline will ensure that the Navy can meet the planned dates for the publication of the Final OEIS/EIS in May 2009 and the Record of Decision in the Summer 2009.
PenderWatch & Conservancy / Spruill, John R.	NGO-004.3	NEPA Compliance	Comment Period Extension	Asks for comment period to be extended to Jan 15, 2009, due to the size of the DEIS document.	After careful consideration, the Navy made the decision not to extend the public comment period. This decision was made after evaluating the extension requests against the requirements under NEPA. Adherence to the project timeline will ensure that the Navy can meet the planned dates for the publication of the Final OEIS/EIS in May 2009 and the Record of Decision in the Summer 2009.

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Sierra Club / Miller, J.D.	NGO-009.1	NEPA Compliance	Comment Period Extension	Asks for an extension of comment period of 30-45 days to allow comments on complex and controversial issue. Navy extended the period on the 2005 DEIS for these reasons.	After careful consideration, the Navy made the decision not to extend the public comment period. This decision was made after evaluating the extension requests against the requirements under NEPA. Adherence to the project timeline will ensure that the Navy can meet the planned dates for the publication of the Final OEIS/EIS in May 2009 and the Record of Decision in the Summer 2009.
NY Whale and Dolphin Action League / Williams, Taffy	NGO-018.1	NEPA Compliance	Comment Period Extension	Protests that Navy did not extend comment period.	After careful consideration, the Navy made the decision not to extend the public comment period. This decision was made after evaluating the extension requests against the requirements under NEPA. Adherence to the project timeline will ensure that the Navy can meet the planned dates for the publication of the Final OEIS/EIS in May 2009 and the Record of Decision in the Summer 2009.
Fried, Debra	P-001.1	NEPA Compliance	Comment Period Extension	Request for extension of comment period to January 15, 2009 due to the size and complexity of document.	After careful consideration, the Navy made the decision not to extend the public comment period. This decision was made after evaluating the extension requests against the requirements under NEPA. Adherence to the project timeline will ensure that the Navy can meet the planned dates for the publication of the Final OEIS/EIS in May 2009 and the Record of Decision in the Summer 2009.

Name/Agency	Letter Number	Comment Category	Comment Subcategory	Comments	Response
Booher, Sam	P-002.1	NEPA Compliance	Comment Period Extension	Request for extension of comment period to January 15, 2009 due to the size and complexity of document.	After careful consideration, the Navy made the decision not to extend the public comment period. This decision was made after evaluating the extension requests against the requirements under NEPA. Adherence to the project timeline will ensure that the Navy can meet the planned dates for the publication of the Final OEIS/EIS in May 2009 and the Record of Decision in the Summer 2009.
Harbison, Candis M.	P-015.1	NEPA Compliance	Comment Period Extension	Request to extend the comment period until January 15, 2009.	After careful consideration, the Navy made the decision not to extend the public comment period. This decision was made after evaluating the extension requests against the requirements under NEPA. Adherence to the project timeline will ensure that the Navy can meet the planned dates for the publication of the Final OEIS/EIS in May 2009 and the Record of Decision in the Summer 2009.
Harbison, Candis M.	P-015.3	NEPA Compliance	Comment Period Extension	Request to extend the comment period until January 15, 2009.	After careful consideration, the Navy made the decision not to extend the public comment period. This decision was made after evaluating the extension requests against the requirements under NEPA. Adherence to the project timeline will ensure that the Navy can meet the planned dates for the publication of the Final OEIS/EIS in May 2009 and the Record of Decision in the Summer 2009.

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Eckert, Jaqueline	P-021.1	NEPA Compliance	Comment Period Extension	Request for extension of comment period to January 15, 2009 due to the size and complexity of document.	After careful consideration, the Navy made the decision not to extend the public comment period. This decision was made after evaluating the extension requests against the requirements under NEPA. Adherence to the project timeline will ensure that the Navy can meet the planned dates for the publication of the Final OEIS/EIS in May 2009 and the Record of Decision in the Summer 2009.
Johnson, Wayne	P-024.1	NEPA Compliance	Comment Period Extension	Asks that hearings be postponed until January 15, 2009 to give the public more time to study the proposal.	After careful consideration, the Navy made the decision not to extend the public comment period. This decision was made after evaluating the extension requests against the requirements under NEPA. Adherence to the project timeline will ensure that the Navy can meet the planned dates for the publication of the Final OEIS/EIS in May 2009 and the Record of Decision in the Summer 2009.
Sheilds, Brenda	P-029.3	NEPA Compliance	Comment Period Extension	The public in northern Florida needs more time to familiarize itself with the USWTR issue.	After careful consideration, the Navy made the decision not to extend the public comment period. This decision was made after evaluating the extension requests against the requirements under NEPA. Adherence to the project timeline will ensure that the Navy can meet the planned dates for the publication of the Final OEIS/EIS in May 2009 and the Record of Decision in the Summer 2009.

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Nowlin, Michelle	P-035.2	NEPA Compliance	Comment Period Extension	Asks that Navy extend the comment period to Jan 15 due to level of public interest in multiple complex documents.	After careful consideration, the Navy made the decision not to extend the public comment period. This decision was made after evaluating the extension requests against the requirements under NEPA. Adherence to the project timeline will ensure that the Navy can meet the planned dates for the publication of the Final OEIS/EIS in May 2009 and the Record of Decision in the Summer 2009.
Hill, David	P-042.4	NEPA Compliance	Comment Period Extension	Requests extension of comment period required to analyzed document and allow Supreme Court to make a decision on the California mid-freq sonar case, which is relevant to USWTR.	After careful consideration, the Navy made the decision not to extend the public comment period. This decision was made after evaluating the extension requests against the requirements under NEPA. Adherence to the project timeline will ensure that the Navy can meet the planned dates for the publication of the Final OEIS/EIS in May 2009 and the Record of Decision in the Summer 2009.
Sutherland, Kate	P-044.1	NEPA Compliance	Comment Period Extension	Requests extension of comment period until Jan 15, 2009 in the hopes of all parties making solid comments on the large DEIS document.	After careful consideration, the Navy made the decision not to extend the public comment period. This decision was made after evaluating the extension requests against the requirements under NEPA. Adherence to the project timeline will ensure that the Navy can meet the planned dates for the publication of the Final OEIS/EIS in May 2009 and the Record of Decision in the Summer 2009.

Name/Agency	Letter Number	Comment Category	Comment Subcategory	Comments	Response
Sellers, Stephanie	P-048.1	NEPA Compliance	Comment Period Extension	Requests extension of comment period until Jan 15, 2009 due to the simultaneous release of the Cherry Point EIS, giving the public two large, complex documents to review in the minimum time required by NEPA.	After careful consideration, the Navy made the decision not to extend the public comment period. This decision was made after evaluating the extension requests against the requirements under NEPA. Adherence to the project timeline will ensure that the Navy can meet the planned dates for the publication of the Final OEIS/EIS in May 2009 and the Record of Decision in the Summer 2009.
Shields, Brenda	P-060.5	NEPA Compliance	Comment Period Extension	Requests more time for public input.	After careful consideration, the Navy made the decision not to extend the public comment period. This decision was made after evaluating the extension requests against the requirements under NEPA. Adherence to the project timeline will ensure that the Navy can meet the planned dates for the publication of the Final OEIS/EIS in May 2009 and the Record of Decision in the Summer 2009.
Alsentzer, Mary and Ulrich	P-066.3	NEPA Compliance	Comment Period Extension	Extend the comment period to Jan 15, 2009 to give the public a chance to make meaningful comments.	After careful consideration, the Navy made the decision not to extend the public comment period. This decision was made after evaluating the extension requests against the requirements under NEPA. Adherence to the project timeline will ensure that the Navy can meet the planned dates for the publication of the Final OEIS/EIS in May 2009 and the Record of Decision in the Summer 2009.

Name/Agency	Letter Number	Comment Category	Comment Subcategory	Comments	Response
Brown, Mary L.	P-068.1	NEPA Compliance	Comment Period Extension	Requests extension of comment period.	After careful consideration, the Navy made the decision not to extend the public comment period. This decision was made after evaluating the extension requests against the requirements under NEPA. Adherence to the project timeline will ensure that the Navy can meet the planned dates for the publication of the Final OEIS/EIS in May 2009 and the Record of Decision in the Summer 2009.
Guidi, William and Doris	P-073.1	NEPA Compliance	Comment Period Extension	Requests extension of comment period.	After careful consideration, the Navy made the decision not to extend the public comment period. This decision was made after evaluating the extension requests against the requirements under NEPA. Adherence to the project timeline will ensure that the Navy can meet the planned dates for the publication of the Final OEIS/EIS in May 2009 and the Record of Decision in the Summer 2009.
North Carolina Wildlife Federation / Gestwicki, Tim	S-002.1	NEPA Compliance	Comment Period Extension	Requests an extension of the comment period to Jan 15, 2009 due to the fact that it is a complex and controversial issue, and that the DEIS has been completely revised.	After careful consideration, the Navy made the decision not to extend the public comment period. This decision was made after evaluating the extension requests against the requirements under NEPA. Adherence to the project timeline will ensure that the Navy can meet the planned dates for the publication of the Final OEIS/EIS in May 2009 and the Record of Decision in the Summer 2009.

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PenderWatch & Conservancy / Spruill, John R.	NGO-004.1	NEPA Compliance	Purpose and Need	Any comment made on either sonar-related EIS document should be considered for both EISs.	Since the two documents are for different projects with different actions, purpose, and needs, we can not categorically apply all comments from one to the other.
Jacksonville Area Ship Repair Association / Froehlich, Ed	NGO-008.3	NEPA Compliance	Purpose and Need	ASW should be more of a priority, as US is actively patrolling hostile waters.	Comment noted.
Jacksonville Area Ship Repair Association / Froehlich, Ed	NGO-008.4	NEPA Compliance	Purpose and Need	Navy is concerned about the environment, but trade-offs have to be made. The Navy is attempting to limit impact through mitigation.	Comment noted.
Duke Environmental Law & Policy Clinic	NGO-012.1	NEPA Compliance	Purpose and Need	NEPA places environmental concerns on equal footing with military interests.	Comment noted.
Duke Environmental Law & Policy Clinic	NGO-012.47	NEPA Compliance	Purpose and Need	DEIS violates Navy's obligations under NEPA, and could violate ESA and MMPA if implemented as planned.	The EIS was prepared in accordance with NEPA. The Navy is consulting with NMFS under ESA Section 7 and will coordinate under MMPA.

Name/Agency	Letter Number	Comment Category	Comment Subcategory	Comments	Response
Duke Environmental Law & Policy Clinic	NGO-012.5	NEPA Compliance	Purpose and Need	Navy has failed to follow CEQ regulation: 40 C.F.R. § 1502.22 - preparing an EIS for which information is incomplete or unknown. It requires additional research (if costs are not exorbitant) or acknowledgement of the incomplete nature of the data and the uncertainty due to lack of data, and the exorbitant costs.	The EIS represents the best available and most applicable science. The Navy is funding research to gather additional data.
Southern Environmental Law Center / Wannamaker, Catherine M.	NGO-017.2	NEPA Compliance	Purpose and Need	NEPA requires a single comprehensive DEIS encompassing USWTR + Atlantic Fleet Active Sonar Training + Jacksonville Range Complex.	The AFAST and Jacksonville Range Complex are separate proposals in structure and purpose, and as such are being analyzed in separate environmental planning documents. Please refer to Section 4.8 for a discussion of cumulative impacts, including discussions of these projects.

Name/Agency	Letter Number	Comment Category	Comment Subcategory	Comments	Response
Southern Environmental Law Center / Wannamaker, Catherine M.	NGO-017.50	NEPA Compliance	Purpose and Need	Lack of data goes against 40 C.F.R. § 1502.22. Data must be obtained if costs are not exorbitant, or the lack of data must be acknowledged, with a risk analysis, other applicable data, and a description of why data can't be obtained.	The EIS represents the best available and most applicable science. Refer to Subchapter 6.1.3.2. The Navy supports a number of research efforts that are investigating potential effects of sonar on marine mammals. During 2004-2008, DoN provided over $94 million in funding to support marine research, and has budgeted $22 million for 2009. This research will improve detection and monitoring of marine species, and further evaluate the effect of sound on marine life. NEPA does not require the selection of the least environmentally damaging alternative.
Southern Environmental Law Center / Wannamaker, Catherine M.	NGO-017.56	NEPA Compliance	Purpose and Need	Navy is improperly segmenting EIS of 3 similar projects: USWTR, AFAST, and Jacksonville Range Complex. A single comprehensive EIS is required.	The AFAST and Jacksonville Range Complex are separate proposals in structure and purpose, and as such are being analyzed in separate environmental planning documents. Please refer to Section 4.8 for a discussion of cumulative impacts, including discussions of these projects.
Citizens Opposing Active Sonar Threats (COAST) / Wray, Russell	NGO-025.1	NEPA Compliance	Purpose and Need	Navy overstates threat of enemy submarines, while failing to recognize security threats from degradation of the environment.	The Navy does not concur with this statement, see Chapter 1 for need to train. No Action Alternative would be detrimental to training efficiency and effectiveness primarily because it lacks timely feedback of performance data to participating units.

Name/Agency	Letter Number	Comment Category	Comment Subcategory	Comments	Response
Citizens Opposing Active Sonar Threats (COAST) / Wray, Russell	NGO-025.2	NEPA Compliance	Purpose and Need	Believes that Navy made its decision beforehand, and wrote DEIS to support that decision.	The Navy does not concur with this statement.
Citizens Opposing Active Sonar Threats (COAST) / Wray, Russell	NGO-025.3	NEPA Compliance	Purpose and Need	Navy has not seriously considered public comments.	Comments received in response to the 2008 draft OEIS/EIS were considered and utilized.
Natural Resources Defense Council (NRDC)	NGO-026.142	NEPA Compliance	Purpose and Need	DEIS claims (1-13) to be prepared under EO 12114 rather than NEPA, which is inconsistent with the statute and indicates likely violation.	Document is being prepared in compliance with EO 12114 and NEPA - it is an OEIS/EIS
Natural Resources Defense Council (NRDC)	NGO-026.145	NEPA Compliance	Purpose and Need	As there are unresolved conflicts, Navy must explicitly address separate and independent obligations under Section 4332(2)(E).	Please refer to Subchapter 2.1 in the USWTR EIS. The Navy did evaluate other alternatives that were considered but eliminated.
Natural Resources Defense Council (NRDC)	NGO-026.18	NEPA Compliance	Purpose and Need	DEIS fails to meet standards of rigor and objectivity under NEPA.	The Navy does not concur with this statement. The EIS represents the best available and most applicable science. Please refer to relevant sections of Chapter 4. Landside impacts and impacts in the U.S. territorial seas have been analyzed per the provisions of NEPA.

Name/Agency	Letter Number	Comment Category	Comment Subcategory	Comments	Response
Natural Resources Defense Council (NRDC)	NGO-026.97	NEPA Compliance	Purpose and Need	Purpose and need statement does not explain why so few alternatives are being analyzed.	Please refer to Chapter 2 for analysis of alternatives.
Pillmore, Patricia J.	P-019.3	NEPA Compliance	Purpose and Need	This is a futuristic [? -word illegible] weapon and we do not want it in our rivers.	Comment noted.
Culler, William S.	P-033.2	NEPA Compliance	Purpose and Need	There is a need for USWTR to train Navy to track diesel submarines, which is a perishable skill, in a realistic situation.	Comment noted.
Nowlin, Michelle	P-035.3	NEPA Compliance	Purpose and Need	Litigation section of the DEIS is sparse and does not meet NEPA requirements.	Other environmental requirements that were considered and deemed relevant to USWTR are discussed in Subchapter 1.6.
Booher, Sam	P-040.7	NEPA Compliance	Purpose and Need	Navy's proposed two years of study may not be sufficient. The Navy must not rush due to need for training.	The Navy does not concur. Please refer to Subchapters 1.2 and 1.3 for the need to conduct training.

Name/Agency	Letter Number	Comment Category	Comment Subcategory	Comments	Response
Van Saum, David	P-058.4	NEPA Compliance	Purpose and Need	Risk to national security increases without 'in kind' training of locating submarines.	Comment noted.
Platt, Eugene	P-086.1	NEPA Compliance	Purpose and Need	Threats expressed in DEIS not sufficient for this level of project/impact. Divulging any additional threats would aid in justifying project.	Comment noted.
Platt, Eugene	P-086.2	NEPA Compliance	Purpose and Need	US nuclear stockpile a sufficient deterrent to enemies, USWTR not as vital.	Comment noted.
Carter, Larry	P-088.1	NEPA Compliance	Purpose and Need	Project not needed due to lack of active security threat since 1945, threat level not worth environmental risk.	The Navy does not concur with this statement. Please refer to Subchapters 1.2 and 1.3 for need for USWTR.
Carter, Larry	P-088.2	NEPA Compliance	Purpose and Need	USWTR will not help against fighting terrorist threat.	Comment noted.

Name/Agency	Letter Number	Comment Category	Comment Subcategory	Comments	Response
Carter, Larry	P-088.5	NEPA Compliance	Purpose and Need	Disturbing the environment may be necessary during active deployment, but not during training.	See discussion of need to train as we fight in Chapter 1.
Simms, Bonnie	P-094.1	NEPA Compliance	Purpose and Need	Peacetime military operations should not take precedent over endangered species.	Comment noted. Please refer to Chapter 1 for explanation of the need for USWTR and recognized potential threats.
Earthjustice / Renshaw, Katie	NGO-019.39	NEPA Compliance	SDEIS	As DEIS is insufficiently detailed, it cannot be used as a Record of Decision, and a more complete revised DEIS must be issued.	Comment noted. The final OEIS/EIS (not including appendices) is 1,000 pages long. There is extensive analysis provided of the environmental impacts of the proposed action.
FL Department of Environmental Protection (FLDEP) / Griffin, Lynn (General)	S-020.10	NEPA Compliance	Alternatives Analysis	Please explain the determination that some impacts are outside US territory? Why was the Exclusive Economic Zone (EEZ) not included in analyzing the location of impacts? Please explain why NEPA analysis is not applied to waters out from the state-federal boundary to the EEZ.	Please refer to the discussion of the EEZ issues in Chapter 1, section 1.5.1 of the DEIS. The USWTR site is located within the exclusive economic zone of the U.S. and the environmental impacts are analyzed in the EIS under EO 12114. The Proposed Action that occurs within the U.S. territorial seas and on the shore is evaluated under the National Environmental Policy Act (NEPA).

Name/Agency	Letter Number	Comment Category	Comment Subcategory	Comments	Response
FL Department of Environmental Protection (FLDEP) / Griffin, Lynn (General)	S-020.5	Proposed Action	ASW Exercises	Will other types of exercises be conducted on the USWTR besides the Anti-submarine Warfare (ASW). If so, please explain.	A description of all of the training to be performed on the USWTR can be found in Chapter 2 and Subchapter 4.8 of the EIS.
FL Department of Environmental Protection (FLDEP) / Griffin, Lynn (General)	S-020.12	Proposed Action	Equipment Characteristics	This section states that directional drilling techniques will be used to bring the trunk cable on shore. Please describe the directional drilling process, in detail. Where exit/entrance pits will be located; how drilling fluids will be handled; the possibility frac outs including the procedures that will be used to minimize and respond to frac outs.	Please refer to revised Subchapter 4.1.1.1 for a description of the anticipated impacts associated with the installation of the cables and nodes. Additional information regarding installation can be found in the revised Chapter 2. Engineering design on the cable installation will be undertaken once true bottom conditions are documented through the bottom mapping effort. Once the bottom mapping is complete, definitive plans (including best management practices) will be developed specific to the surveyed site conditions.
FL Department of Environmental Protection (FLDEP) / Griffin, Lynn (General)	S-020.28	Proposed Action	Equipment Characteristics	Please provide references for the battery study of the Aid to Navigation sites in California. Please provide references for the prototype investigations.	Please refer to the referenced USEPA, 2001. In addition, the National Plan For ATON Battery Recovery and Disposal can be found at http://www.uscg.mil/directives/ci/16000-16999/CI_16478_12.pdf.

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Citizens Opposing Active Sonar Threats (COAST) / Wray, Russell	NGO-025.30	Regulatory Compliance	ESA	Other ESA-listed whales have situations similar to that of right whale, and should be considered as such.	Impacts to other ESA-listed whales have been considered in detail. Please refer to Subchapter 4.3.8: Anticipated Acoustic Effects to ESA-listed Marine Mammals. The Navy has consulted with NMFS on effect to listed species, in accordance with ESA, and will consult with NMFS under MMPA.
Citizens Opposing Active Sonar Threats (COAST) / Wray, Russell	NGO-025.5	Regulatory Compliance	ESA	DEIS improperly minimizes impact to ESA-listed species.	The Navy has consulted with NMFS under ESA; and may consult with USFWS, if needed; on effect to listed species. Please refer to discussion in Chapter 4.
VA Dept of Game and Inland Fisheries (VDGIF) / Ewing, Amy	S-015.1	Regulatory Compliance	ESA	If landside construction takes place during piping plover and loggerhead turtle breeding seasons, Navy should get a ESA Section 7 consultation with USFWS.	The Navy will coordinate with USFWS, as needed, during landside installation to ensure compliance with ESA. Impacts on beach and dune habitats should be avoided by horizontal directional drilling of a conduit under the beach.
Marine Mammal Commission / Ragen, Timothy J.	F-004.7	Regulatory Compliance	MMPA	Navy has not requested a Level A harassment authorization, meaning the taking of an animal will be a violation of MMPA and require stopping USWTR activities until assurances that no further takes will occur.	Navy anticipates no Level A takes and will consult with NMFS to obtain authorization prior to training activities.
Natural Resources Defense Council (NRDC)	NGO-026.143	Regulatory Compliance	MMPA	[List of applicable laws USWTR must comply with: MMPA, ESA, CZMA, Magnuson-Stevens, Marine Protection, Research and Sanctuaries Act, Migratory Bird Treaty Act, EO 13158]	Comment noted. Please refer to discussion in Chapter 1.

Name/Agency	Letter Number	Comment Category	Comment Subcategory	Comments	Response
Office of the Mayor of Jacksonville / McCarthy, Julian	L-001.5	Sea Turtle	Distribution	Navy and City of Jacksonville support the conservation of turtle populations.	Comment noted.
Duke Environmental Law & Policy Clinic	NGO-012.14	Sea Turtle	Distribution	Navy's assumption of minimal threats due to low density of turtles is not supported by data. A large percent of the population occurs in the USWTR areas, and observational surveys likely seriously underestimate their numbers. Navy does not explain why data cannot be obtained. Turtle density data can be obtained from TEWG website.	Sea turtle density information is detailed in the Navy's NODE report (2007) in which densities were calculated using aerial survey data provided by the NMFS-NEFSC and the NMFS-SEFSC. The NODE report is available on the USWTR Web site. The TEWG Web site provides documents which assess sea turtle population sizes, not density estimates. These population sizes are based on nesting data and can only be used to estimate the number of turtles that may be in the stock, not their location. Density estimates can only be extrapolated from sighting data, such as that provided in aerial surveys.
Duke Environmental Law & Policy Clinic	NGO-012.18	Sea Turtle	Distribution	Although turtle density estimates are not reliable, they must be included for an informed decision.	Sea turtle density information is detailed in the Navy's NODE report (2007) in which densities were calculated using aerial survey data provided by the NMFS-NEFSC and the NMFS-SEFSC. This information was used to assess impacts to sea turtle species for the USWTR EIS.

Name/Agency	Letter Number	Comment Category	Comment Subcategory	Comments	Response
Duke Environmental Law & Policy Clinic	NGO-012.23	Sea Turtle	Distribution	Brumation data is lacking, and does not explain that data is lacking and why the Navy cannot obtain it.	Additional information on brumation and studies performed along the east coast of the US have been added to Subchapter 4.2.4. The Navy is consulting with NMFS on all potential impacts to sea turtles.
Duke Environmental Law & Policy Clinic	NGO-012.24	Sea Turtle	Distribution	The assertion that turtle brumation is less likely off of SC does not mean that no brumation takes place.	As described in Subchapter 4.2.4, subsequent studies attempting to locate overwintering sea turtles along the Georgia and South Carolina coasts were unsuccessful. To date no definitive evidence has been reported. Based on the restricted latitude at which overwintering sea turtles have been observed, it is highly unlikely that sea turtles brumate off the South Carolina coast. The Navy is consulting with NMFS on all potential impacts to sea turtles.

Name/Agency	Letter Number	Comment Category	Comment Subcategory	Comments	Response
Duke Environmental Law & Policy Clinic	NGO-012.25	Sea Turtle	Distribution	Sea turtle brumation data is also important as they could become entangled in cables, or dig up buried cables. Depth of brumation is important to ensure that the cable is not dug up.	No definitive evidence of brumation has been reported. Carr et al., 1980 proposed that the torpid, mud covered sea turtles collected during their study resulted from hibernation. However, no direct observation of prolonged hibernation has been observed and the results of simulated hibernation studies suggest that sea turtle do not exhibit the behaviors which would qualify as hibernation under existing reptilian definitions (Moon et al., 1997). No data exists which details how deep turtles may dig within the substrate to potentially brumate. The Navy is consulting with NMFS on all potential impacts to sea turtles.
Duke Environmental Law & Policy Clinic	NGO-012.29	Sea Turtle	Distribution	NOAA researchers have identified inshore and estuarine habitats in the USWTR areas in need of further population study.	Comment noted.

Name/Agency	Letter Number	Comment Category	Comment Subcategory	Comments	Response
Duke Environmental Law & Policy Clinic	NGO-012.3	Sea Turtle	Distribution	Concerns about relatively little study to assess distribution and abundance of sea turtles	Sea turtle density information is detailed in the Navy's NODE report (2007) in which densities were calculated using aerial survey data provided by the NMFS-NEFSC and the NMFS-SEFSC. This information was used to assess impacts to sea turtle species for the USWTR EIS. Information regarding abundance is detailed in the Navy's Marine Resources Assessments (MRAs) for various geographic areas. The MRAs are available on the USWTR Web site. A detailed list of all data sources in included in these documents.
Duke Environmental Law & Policy Clinic	NGO-012.31	Sea Turtle	Distribution	Urge collection of accurate information of presence, abundance and distribution of sea turtles.	Sea turtle density information is detailed in the Navy's NODE report (2007) in which densities were calculated using aerial survey data provided by the NMFS-NEFSC and the NMFS-SEFSC. This information was used to assess impacts to sea turtle species for the USWTR EIS. Information regarding abundance is detailed in the Navy's Marine Resources Assessments (MRAs) for various geographic areas. A detailed list of all data sources in included in these documents.

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Duke Environmental Law & Policy Clinic	NGO-012.4	Sea Turtle	Distribution	Studies show that SE GA, Northeast FL are important habitat for sea turtles. Loggerhead populations are highest along Northeast FL, and Sargassum mats pass through the proposed USWTR.	The Navy acknowledges in the EIS that *Sargassum* mats are present within the USWTR sites, but that their presence is transient and dependent on prevailing surface currents. The Navy also acknowledges research that has shown the importance of loggerhead populations along the SE coast. The Navy is consulting with NMFS (and will coordinate with USFWS if necessary) on potential impacts to sea turtles on the range.
Duke Environmental Law & Policy Clinic	NGO-012.7	Sea Turtle	Distribution	Draft recovery plan for loggerhead turtles (released May 2008), show that population from VA to GA have declined 1.6% annually.	The Navy acknowledges in the EIS that Sargassum mats are present within the USWTR sites, but that their presence is transient and dependent on prevailing surface currents. The Navy also acknowledges research that has shown the importance of loggerhead populations along the SE coast. The Navy is consulting with NMFS (and will coordinate with USFWS if necessary) on potential impacts to sea turtles on the range.

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Sierra Club (GA Chapter) / Grainey, Karen	NGO-015.4	Sea Turtle	Distribution	GA DNR has field data that shows a richer community than the Navy presents. Losses due to USWTR could be greater than DEIS predicts. In particular, loggerhead populations are larger than DEIS estimate.	The Navy acknowledges that the northern subpopulation (NC, SC, GA, and Northeast FL) is the second largest loggerhead subpopulation on the Atlantic coast, preceded only by the South FL subpopulation. The EIS uses the best available science, as provided by NMFS and USFWS. The Navy does not anticipate any significant impacts to sea turtles due to the proposed range. In addition, the construction of the range is unlikely to affect nesting populations along the Georgia coast, and specifically at Cumberland Island since no equipment will be installed on those nesting beaches.
Southern Environmental Law Center / Wannamaker, Catherine M.	NGO-017.34	Sea Turtle	Distribution	Disturbance of bruminating sea turtles by cable installation should be quantified (as per NEPA), not dismissed as 'of limited duration'. Brumination is poorly understood and DEIS provides no data.	Although it is possible that sea turtles may overwinter in the Site A area, it is unlikely as the Site A area is in far deeper water than brumation has been observed and is further north than areas where torpid turtles have been observed. In addition, as discussed in Subchapter 4.2.4, sea turtle brumation along the east coast of the US has many uncertainties associated with it. The Navy is consulting with NMFS on mitigating any impact that could possibly result from the installation of USWTR equipment.

Name/Agency	Letter Number	Comment Category	Comment Subcategory	Comments	Response
Southern Environmental Law Center / Wannamaker, Catherine M.	NGO-017.46	Sea Turtle	Distribution	Installation of cable could impact turtle nests if done during nesting season. Construction noise may disturb nesting behavior.	Please refer to Subchapter 4.6.3 or 6.19. Impacts to turtle nesting will be avoided through the use of horizontal directional drilling of a conduit under the beach and dune habitats. There could be temporary impacts to the nesting activities of the federally threatened loggerhead sea turtle, and endangered green sea and leatherback turtles if installation occurs during nesting months. Under such circumstances, consultation with the USFWS would be conducted before initiating any construction activities. In addition, conservation measures are in place at all site alternatives to reduce or eliminate impacts to sea turtles.
Earthjustice / Renshaw, Katie	NGO-019.13	Sea Turtle	Distribution	Navy needs more information on turtle populations before assessing impact and mitigation measures. Extrapolations could be made with estimates of turtle dive duration.	The EIS presents the best available and most applicable science.

Name/Agency	Letter Number	Comment Category	Comment Subcategory	Comments	Response
Earthjustice / Renshaw, Katie	NGO-019.4	Sea Turtle	Distribution	DEIS must expand discussion of potential impacts on turtle nets - including methods, machines used in installation. This is needed before mitigation can be assessed.	Impacts to turtle nesting will be avoided through the use of horizontal directional drilling of a conduit under the beach and dune habitats. Impacts to sea turtle nesting habitat will be temporary due to the limited time frame for the construction of any landside facilities. Should construction take place during sea turtle nesting season, USFWS will be consulted before construction proceeds. The exact model/type of undersea cable burial equipment has not been identified. The Navy will consult with NMFS regarding any potential impacts to sea turtles that may result from construction and the types of equipment used.
Earthjustice / Renshaw, Katie	NGO-019.6	Sea Turtle	Distribution	Belief that turtles will not be impacted by installation, as they will 'move out of the way', is not supported by evidence.	The cable installation ship proceeds at a slow speed (about 1 to 2 knots) while laying cable. It is unlikely that a sea turtle would not be able to avoid the ship.
Beasley, Jean	P-027.1	Sea Turtle	Distribution	The NC alternative is within sea turtle winter habitat. Research exists that indicates serious impacts of USWTR on sea turtles that the DEIS does not adequately assess.	The Navy is not aware of indicated research that would suggest serious impacts from USWTR on sea turtles. Based upon the best available scientific information, the Navy has determined that there will be no impacts from sonar on sea turtles.

Name/Agency	Letter Number	Comment Category	Comment Subcategory	Comments	Response
Nowlin, Michelle	P-035.4	Sea Turtle	Distribution	Claims of no impact on sea turtles are based on absence of data, therefore the claim cannot be supported.	Limited data available on sea turtle hearing suggests that the sea turtle hearing range does not overlap with the frequency range of sonar. Please see Subchapter 3.3.2.3 for a discussion on sea turtle hearing summarizing existing data on sea turtle hearing.
Thomas, Sean	P-037.1	Sea Turtle	Distribution	Data on sea turtle densities is not present. The assumption of non-interaction is invalid without knowing turtle densities.	Sea turtle density information is detailed in the Navy's NODE report (2007) in which densities were calculated using aerial survey data provided by the NMFS-NEFSC and the NMFS-SEFSC. This information was used to assess impacts to sea turtle species for the USWTR EIS.
Booher, Sam	P-040.17	Sea Turtle	Distribution	Compiled data show sea turtle densities higher than presented by the Navy. The Cumberland Island, GA sanctuary is near the proposed testing range.	Sea turtle density information is detailed in the Navy's NODE report (2007) in which densities were calculated using aerial survey data provided by the NMFS-NEFSC and the NMFS-SEFSC. This information was used to assess impacts to sea turtle species for the USWTR EIS. Based upon the best available scientific information, the Navy has determined that there will be no impacts from sonar on sea turtles.

Name/Agency	Letter Number	Comment Category	Comment Subcategory	Comments	Response
Archer, Linda	P-096.1	Sea Turtle	Distribution	Brevard County is the most important nesting site in the Western Hemisphere for loggerhead sea turtles.	Impacts to turtle nesting will be avoided through the use of horizontal directional drilling of a conduit under the beach and dune habitats. Impacts to sea turtle nesting habitat will be temporary due to the limited time frame for the construction of any landside facilities. Should construction take place during sea turtle nesting season, USFWS will be consulted before construction proceeds. The exact model/type of undersea cable burial equipment has not been identified. The Navy will consult with NMFS regarding any potential impacts to sea turtles that may result from construction and the types of equipment used.
VA Dept of Game and Inland Fisheries (VDGIF) / Ewing, Amy	S-015.3	Sea Turtle	Distribution	Loggerhead turtle nest found in 2002 in a suboptimal site north of landfall site, indicating a potential for future nesting in close proximity to the landfall site.	Impacts to turtle nesting will be avoided through the use of horizontal directional drilling of a conduit under the beach and dune habitats. Impacts to sea turtle nesting habitat will be temporary due to the limited time frame for the construction of any landside facilities. Should construction take place during sea turtle nesting season, USFWS will be consulted before construction proceeds. The exact model/type of undersea cable burial equipment has not been identified. The Navy will consult with NMFS regarding any potential impacts to sea turtles that may result from construction and the types of equipment used.

Name/Agency	Letter Number	Comment Category	Comment Subcategory	Comments	Response
Duke Environmental Law & Policy Clinic	NGO-012.10	Sea Turtle	Electromagnetic	DEIS does not address possible impact to turtles from cable/transducer electromagnetic field. Research shows that turtles have a 'magnetic map' for movement, disruption of which may disrupt navigation.	The fiber optic cables that would be used in USWTR have much less ferrous material within them than traditional coaxial cable, thereby resulting in a significantly smaller electromagnetic field (see the revised Subchapter 4.2.4). Should installation of any equipment occur within sea turtle nesting season, USFWS will be consulted prior to construction proceeding. The Navy is consulting with the NMFS regarding potential impacts to sea turtles in the ocean.
North Carolina Wildlife Resources Commission (NCWRC) / Dunn, Maria T.	S-005.5	Sea Turtle	Electromagnetic	Magnetic field distortion could disrupt turtle hatchling orientation (Irwin and Lohmann, 2003) in nests near the trunk cable. Relocation of nests (away from trunk) could impact fitness and sex ratio. Installation of trunk cable must occur outside USFWS sea turtle moratorium (May 1-Nov 15).	The fiber optic cables that would be used in USWTR have much less ferrous material within them than traditional coaxial cable, thereby resulting in a significantly smaller electromagnetic field (see the revised Subchapter 4.2.4). Should installation of any equipment occur within sea turtle nesting season, USFWS will be consulted prior to construction proceeding. The Navy is consulting with the NMFS regarding potential impacts to sea turtles in the ocean.

Name/Agency	Letter Number	Comment Category	Comment Subcategory	Comments	Response
Duke Environmental Law & Policy Clinic	NGO-012.11	Sea Turtle	Entanglement	Recovery plans for 5 endangered sea turtles cite ingestion of plastics as a significant threat. USWTR will add to load with small parachutes and debris, the impact of which may be increased as they disintegrate into smaller pieces.	The Navy acknowledges the potential risks that parachutes and debris may have on sea turtles which was why an analysis was included in Subchapter 4.2. The parachutes are weighted and will sink shortly after impact, where it has been recorded to lay flat on the seafloor so that no entanglement should occur (ESG, 2005). Based on that analysis and the mitigation measures in place, the Navy determined that the USWTR may affect ESA listed species, but that, in accordance with NEPA, it will have no adverse effects on sea turtles.
Duke Environmental Law & Policy Clinic	NGO-012.12	Sea Turtle	Entanglement	Sargassum mats may impede the sinking of parachutes and other debris, making them more of a hazard to marine life (especially the turtle hatchlings using the mat as habitat).	The presence of *Sargassum* in any of the proposed USWTR sites is transient and dependent on prevailing surface currents. As a result, the probability that a Sargassum raft would be directly impacted by the launching of a parachute is extremely low. In accordance with NEPA, no adverse effects to sea turtles are predicted. Furthermore, the Navy is consulting with NMFS regarding mitigation measures related to EFH (including *Sargassum* rafts).

Name/Agency	Letter Number	Comment Category	Comment Subcategory	Comments	Response
Duke Environmental Law & Policy Clinic	NGO-012.17	Sea Turtle	Entanglement	Navy fails to follow 42 U.S.C. § 4332(C), claiming no adverse effects but failing to provide a basis for the conclusion. Specifically, impacts on sea turtles from exercise torpedoes, flex hoses, sensing devices, targets, and vessels are dismissed due to 'low likelihood' but without estimations on probabilities.	Cannot accurately predict physical impact to turtles due to low densities of turtles and USWTR material release. The materials used have a potential to impact sea turtles, and analysis were included in the EIS (Subchapter 4.2). Analysis of control wires and flex hoses (DoN, 1996a) concluded that there would be no adverse effects on sea turtles. Past EXTORP events from 1968 to present (14,000) indicate no recorded/reported strikes, and concludes (under NEPA) that no adverse effects to sea turtles will occur. Analysis of sensing devices and countermeasures in Subchapters 4.2.1.3, 4.2.2.3, and 4.2.3.3 all conclude no adverse effects. The analysis of the potential for entanglement in parachutes concluded that there would be no adverse effects to sea turtles. There is a potential for vessel impacts to sea turtles, but based on standard operating procedures and mitigation measures (refer to Chapter 6) adverse effects are not expected. The Navy is consulting with NMFS regarding all potential impacts and mitigation measures involving sea turtles.

Name/Agency	Letter Number	Comment Category	Comment Subcategory	Comments	Response
Southern Environmental Law Center / Wannamaker, Catherine M.	NGO-017.36	Sea Turtle	Entanglement	Claim that turtles will not become entangled or ingest debris/parachutes must be reconsidered, as turtles are attracted to debris and parachutes can billow underwater, increasing risk of entanglement.	The Navy acknowledges the potential risks that parachutes and debris may have on sea turtles which was why an analysis was included in Subchapter 4.2. The parachutes are weighted and will sink shortly after impact, where it has been recorded to lay flat on the seafloor so that no entanglement should occur (ESG, 2005). Based on that analysis and the mitigation measures in place, the Navy determined that the USWTR may affect ESA listed species, but that, in accordance with NEPA, it will have no adverse effects on sea turtles.
Southern Environmental Law Center / Wannamaker, Catherine M.	NGO-017.37	Sea Turtle	Entanglement	Loggerhead turtles are significantly impacted through entanglement, debris and pollution - all of which will be increased by USWTR.	Cannot accurately predict physical impact to turtles due to low densities of turtles and USWTR material release. Please refer to Subchapter 4.2. The Navy acknowledges the risk entanglement may pose to loggerhead sea turtles which is why an analysis of the risk of entanglement that may occur from the Navy's operational materials was included in 4.2. An analysis of control wires and flex hoses (DoN, 1996a) concluded that there would be no adverse effects on sea turtle species. The analysis of the potential for entanglement in parachutes concluded that they may affect ESA-listed species, but that (in accordance with NEPA) there would be no adverse effects to sea turtles.

Name/Agency	Letter Number	Comment Category	Comment Subcategory	Comments	Response
Southern Environmental Law Center / Wannamaker, Catherine M.	NGO-017.68	Sea Turtle	Entanglement	Navy should use biodegradable material for parachute and assemblage to limit ingestion and entanglement (and damage of corals and drowning of other species).	The Navy determined that the use of parachutes may affect ESA listed species of sea turtles, but in accordance with NEPA there would be no adverse effects to sea turtles. See 4.2-31 for a detailed analysis.
Beasley, Jean	P-027.3	Sea Turtle	Entanglement	USWTR lines, and cables present an entanglement risk to sea turtles, and boat activity presents further risk.	The USWTR trunk cable would be buried out to the western edge of the range site. Internodes cables would lay flat on the seafloor and is not likely to form loops, and therefore would not likely pose an entanglement risk for sea turtles. The Navy is consulting with NMFS on potential impacts to sea turtles on the range. Overall boat traffic will not increase due to planned decommissioning of vessels as discussed in Jax Range Complex EIS (2009).
Hinckle, Megan	P-034.2	Sea Turtle	Entanglement	Concern that the DEIS underestimates threat of ingestion and entanglement to turtles, including the issue of breakdown of synthetic parachute material into small pieces capable of ingestion by turtles.	Comment noted. Cannot accurately predict physical impact to turtles due to low densities of turtles and USWTR material release. The Navy is consulting with NMFS on potential impacts to sea turtles on the range, and will implement any additional mitigation measures suggested.

Name/Agency	Letter Number	Comment Category	Comment Subcategory	Comments	Response
Hinckle, Megan	P-034.3	Sea Turtle	Entanglement	DEIS does not adequately consider entanglement on the sea floor during brumation, or drowning at shallower depths, by parachutes billowing in currents.	The Navy determined that the potential for a sea turtle to encounter a parachute on the seafloor would be unlikely and the Navy is consulting with NMFS on potential impacts to sea turtles on the range. The physical impact to turtles due to low densities of turtles and USWTR material release cannot be accurately predicted .
PenderWatch & Conservancy / Spruill, John R.	NGO-004.4	Sea Turtle	Sonar	The DEIS inadequately discusses the impact of USWTR on sea turtles.	The Navy uses the best available and most applicable science to analyze the impacts of proposed naval operations on all natural resources. The Navy is consulting with NMFS (and will coordinate with USFWS if necessary) regarding the potential impacts to sea turtles on the range.
Duke Environmental Law & Policy Clinic	NGO-012.20	Sea Turtle	Sonar	Air bubble in turtle middle ear will resonate at frequencies between 900Hz-25kHz	No definitive evidence has been recorded which illustrates that the sea turtle's middle ear resonates at higher level frequencies. The information referenced is not from an individual study regarding resonance and is not published in a scientific, peer reviewed journal. The Navy does not expect any adverse impacts to sea turtle resulting from sonar and is consulting with NMFS regarding all potential sea turtle impacts.

Name/Agency	Letter Number	Comment Category	Comment Subcategory	Comments	Response
Duke Environmental Law & Policy Clinic	NGO-012.21	Sea Turtle	Sonar	High energy resonance may have physiological effects, beyond effects on hearing.	No definitive evidence has been recorded which illustrates that the sea turtle's middle ear resonates at higher level frequencies. The information referenced is not from an individual study regarding resonance and is not published in a scientific, peer reviewed journal. The Navy does not expect any adverse impacts to sea turtle resulting from sonar and is consulting with NMFS regarding all potential sea turtle impacts.
Duke Environmental Law & Policy Clinic	NGO-012.22	Sea Turtle	Sonar	Lack of data for leatherback turtles, with failure to explain why data cannot be obtained. Leatherbacks can produce sounds up to 1200Hz, indicating that their hearing may be more sensitive than other species.	Published information on leatherback hearing has been added to Subchapter 3.3.2.3. It should be noted that although Cook and Forrest (2005) demonstrated leatherbacks can produce sounds as high as 1,200 Hz, they could not conclude whether they were communicative in nature. Communicative sounds fall within the audible range of the species. The authors note that peak frequencies of the sounds they recorded were between 300 to 500 Hz, and are consistent with the low-frequency hearing range found in other turtle species.
Duke Environmental Law & Policy Clinic	NGO-012.8	Sea Turtle	Sonar	Belief that turtles do not hear sonar is unsupported by science. Navy must acknowledge this uncertainty and explain risks.	While the Navy acknowledges that there are limited studies regarding the hearing capabilities of sea turtles, the Navy has analyzed the risks of sonar based on the best available science. See Subchapter 3.3 for a complete review of sea turtle acoustic capabilities.

Name/Agency	Letter Number	Comment Category	Comment Subcategory	Comments	Response
Duke Environmental Law & Policy Clinic	NGO-012.9	Sea Turtle	Sonar	Sea turtle hearing study conclusions are weak, due to: used low-intensity sound, conducted on unsubmerged turtles (who may use a different pathway for underwater hearing), and there may be significant change in hearing with age. More study is needed prior to construction of USWTR.	The Navy acknowledges within the EIS that there are limited studies which examine sea turtle hearing sensitivity. Regardless, the Navy must use the best available science when analyzing the impacts of any proposed action on protected resources. The Navy complies with NEPA by doing so. While limited in its scope and the methods used, the available data all conclude that sea turtles' functional hearing ranges from 30 Hz to 1,000 Hz, with maximum sensitivity varying by species, but centered around 100 to 800 Hz. The Navy is consulting with NMFS on all potential impacts for sea turtles and any mitigation measures that may be necessary.

Name/Agency	Letter Number	Comment Category	Comment Subcategory	Comments	Response
Southern Environmental Law Center / Wannamaker, Catherine M.	NGO-017.38	Sea Turtle	Sonar	Assertions that sea turtles will not be impacted by sonar are unsupported, due to limited evidence. The Navy is obligated by NEPA to collect such data.	While there are limited studies regarding the hearing capabilities of sea turtles, the Navy has analyzed the risks of sonar based on the best available science. Please refer to Subchapter 3.3 for a complete review of sea turtle acoustic capabilities. Published research concludes that most sea turtle species can hear frequencies from 30 to 1,000 Hz, with maximum sensitivity between 100 to 800 Hz (each species varies slightly with their maximum sensitivity). The hearing range for sea turtles is most likely less than 1 kHz (operating in the low frequency category), which is below the level of projected sound sources on USWTR (MFA sonar operates between 1 to 10 kHz). As a result, it has been concluded that sea turtles will not experience acoustic effects due to sonar.
NY Whale and Dolphin Action League / Williams, Taffy	NGO-018.5	Sea Turtle	Sonar	Concern for impact to endangered sea turtles.	Comment noted. The Navy is consulting with NMFS (and will coordinate with USFWS if necessary) on potential impacts to sea turtles.

Name/Agency	Letter Number	Comment Category	Comment Subcategory	Comments	Response
Earthjustice / Renshaw, Katie	NGO-019.10	Sea Turtle	Sonar	Sea turtles are excluded from acoustic analysis due to belief of no impact from mid-freq sonar - despite references contradicting this conclusion.	While there are limited studies regarding the hearing capabilities of sea turtles, the Navy has analyzed the risks of sonar based on the best available science. Please refer to Subchapter 3.3 for a complete review of sea turtle acoustic capabilities. Published research concludes that most sea turtle species can hear frequencies from 30 to 1,000 Hz, with maximum sensitivity between 100 to 800 Hz (each species varies slightly with their maximum sensitivity). The hearing range for sea turtles is most likely less than 1 kHz (operating in the low frequency category), which is below the level of projected sound sources on USWTR (MFA sonar operates between 1 to 10 kHz). As a result, it has been concluded that sea turtles will not experience acoustic effects due to sonar.
Earthjustice / Renshaw, Katie	NGO-019.11	Sea Turtle	Sonar	Sea turtles may incur physical damage from sonar, even if they do not hear it.	No conclusive data exists which details physiological injury which may occur from MFA sonar. Using the best available science, the EIS has concluded that sea turtles will not experience acoustic impacts due to sonar. Refer to Subchapter 4.3.1.3.2 - studies of tissue damage to mammals have been conducted. No study shows tissue damage outside of the PTS threshold. The Navy is consulting with NMFS regarding all potential impacts to sea turtles.

Name/Agency	Letter Number	Comment Category	Comment Subcategory	Comments	Response
Citizens Opposing Active Sonar Threats (COAST) / Wray, Russell	NGO-025.19	Sea Turtle	Sonar	Sea turtles may be impacted by sonar in ways other than hearing. Sonar may be outside of 'best' hearing range, but turtles may still be able to hear it.	While there are limited studies regarding the hearing capabilities of sea turtles, the Navy has analyzed the risks of sonar based on the best available science. See Subchapter 3.3 for a complete review of sea turtle acoustic capabilities. Published research concludes that most sea turtle species can hear frequencies from 30 to 1,000 Hz, with max sensitivity between 100 to 800 Hz (each species varies slightly with their max sensitivity). The hearing range for sea turtles is most likely less than 1 kHz (operating in the low frequency category), which is below the level of projected sound sources on USWTR (MFA sonar operates between 1 to 10 kHz). As a result, it has been concluded that sea turtles will not experience acoustic effects due to sonar.
Natural Resources Defense Council (NRDC)	NGO-026.13	Sea Turtle	Sonar	Turtles are known to flee and exhibit increased stress in response to noise.	The Navy acknowledges that there is evidence of turtles responding to air gun noise by increasing swimming speeds and avoidance of the sound (see Subchapter 3.3). The Navy does not anticipate any significant effects to sea turtles from sonar/acoustic sources. The Navy is consulting with NMFS on all potential impacts to sea turtles.

Name/Agency	Letter Number	Comment Category	Comment Subcategory	Comments	Response
Natural Resources Defense Council (NRDC)	NGO-026.84	Sea Turtle	Sonar	Turtles may hear sound at the lower end of the mid-freq sonar.	The Navy acknowledges that while research into sea turtle hearing capabilities is limited, results have shown that sea turtles hear from 20 to 1,000 Hz, and have a range of maximum sensitivity from 100 to 800 Hz, which falls within the category of low-frequency hearing (see Subchapter 3.3). The best available science concludes that sea turtles hear up to 1kHz, and makes no further conclusions regarding extended ranges of hearing. The Navy does not anticipate any significant impacts to sea turtles due to sonar and is consulting with NMFS regarding all potential impacts to sea turtle species.
Natural Resources Defense Council (NRDC)	NGO-026.85	Sea Turtle	Sonar	Turtles exhibit startle and escape behavior and increased stress in response to vessel noise.	Use of USWTR will not increase Navy vessel traffic. The recently-released Mayport ROD announced that the number of Navy ships based in Mayport is expected to decline from 22 to 12, by 2014.
Asly, Sandy	P-025.1	Sea Turtle	Sonar	Asks how the effect of sonar was tested on hatchlings that live in the proposed USWTR ranges.	There are no known studies testing the effects of sonar on hatchling sea turtles. Therefore, the Navy used adult sea turtle hearing in absence of data as a guide to determine possible effects.

Name/Agency	Letter Number	Comment Category	Comment Subcategory	Comments	Response
Hinckle, Megan	P-034.1	Sea Turtle	Sonar	DEIS does not consider effects of sonar on turtles, despite recent evidence of non-auditory effects on turtle navigation, feeding and reproduction behavior.	The best available science concludes that sea turtles hear up to 1kHz, and makes no further conclusions regarding extended ranges of hearing. The Navy does not anticipate any significant impacts to sea turtles due to sonar and is consulting with NMFS regarding all potential impacts to sea turtle species.
Hill, David	P-042.1	Sea Turtle	Sonar	Reasonable certainty about impacts still exists, more research required on sea turtle and fish stocks required.	Comment noted. The EIS incorporates the best available and most applicable research. Please refer to analyses presented in Subchapters 4.2.2 (fish) and 4.2.4 (turtles).
Alsentzer, Mary and Ulrich	P-066.4	Sea Turtle	Sonar	DEIS has not adequately addressed the impact on sea turtles.	The Navy uses the best available science to analyze the impacts of proposed naval operations on all protected resources. The Navy is consulting with NMFS (and will coordinate with USFWS if necessary) regarding the potential impacts to sea turtles on the range.
Citizens Opposing Active Sonar Threats (COAST) / Wray, Russell	NGO-025.57	Sea Turtles	Entanglement	Assumption that installation impact is limited by short period is flawed as contact could still occur.	Range installation methods are similar to trans-Atlantic communication cables; there is no evidence of impacts to turtles during the installation. Please refer to mitigation measures in Subchapter 6.3 and Subchapter 6.4. Once instrumentation is in place, it would not pose an entanglement risk.

Name/Agency	Letter Number	Comment Category	Comment Subcategory	Comments	Response
Southern Environmental Law Center / Wannamaker, Catherine M.	NGO-017.49	Seabird	Distribution	DEIS lacks analysis on migratory birds, dismissing impact as temporary and insignificant to region. Construction at Mayport Beach may have greater impact on activities of migratory birds.	The cable landfall would not impact the beach or dune habitat, as the trunk cable would be installed by directional drilling under the dunes and the beach. Hence, the determination of no significant impact to birds is considered appropriate.
Natural Resources Defense Council (NRDC)	NGO-026.90	Seabird	Distribution	Seabirds occur in all USWTR sites, can dive hundreds of feet, and can be impacted directly or indirectly (depletion of prey and hard bottom habitat). Therefore, impacts must be further analyzed.	An extensive search was performed on the hearing abilities of seabirds. Based on available literature, there was no indication that seabirds will be impacted by mid-range sonar (see Subchapter 3.3.2.5). There is also no indication that the construction and operation of the USWTR would result in or contribute to depletion of prey or hard bottom habitat. Hence, the analysis contained in the EIS covers potential impacts that could reasonably be anticipated from the proposed action.
North Carolina Wildlife Resources Commission (NCWRC) / Dunn, Maria T.	S-005.1	Seabird	Distribution	Table 3.2-4 (seabirds known to utilize coastal and offshore waters in the vicinity of the OPAREAs) should include open water bird species and sea ducks.	The seabirds discussed in the EIS focused on pelagic birds, also referred to as seabirds or marine birds, which are adapted to living over the open ocean. As the sites evaluated in the proposal ranged from 63 km (39 NM) to 93 km (50 NM) offshore, birds found primarily near the coast were not included in the EIS.

Name/Agency	Letter Number	Comment Category	Comment Subcategory	Comments	Response
VA Dept of Game and Inland Fisheries (VDGIF) / Ewing, Amy	S-015.5	Seabird	Distribution	Little known about migratory seabirds (and landbird migration at sea) in VA waters.	As noted by the commenter, there is little information available on land bird migrations offshore. However, protected birds and migratory birds are included in the landside discussion, where they are likely to be found (e.g., Subchapters 3.6 and 4.6). Based on the evaluations contained in the EIS covering both offshore and landfall sites, the USWTR would not adversely impact land or seabirds.
Citizens Opposing Active Sonar Threats (COAST) / Wray, Russell	NGO-025.20	Seabird	Sonar	Even if seabirds don't use sound underwater, they can still be impacted by sonar.	There is no evidence in the literature (studies or anecdotal) that sonar could cause injury, temporary hearing loss, or behavioral disruptions in seabirds. Given the extensive use of sonar in the oceans, the absence of observations of these type support the decision to exclude them from further acoustic analysis in Subchapter 3.3.
Natural Resources Defense Council (NRDC)	NGO-026.88	Seabird	Sonar	Though seabirds do not use sound underwater (3.3-15), that does not mean that they would not be impacted by sonar.	There is no evidence in the literature (studies or anecdotal) that sonar could cause injury, temporary hearing loss, or behavioral disruptions in seabirds. Given the extensive use of sonar in the oceans, the absence of observations of this type supports the decision to exclude them from further acoustic analysis in Subchapter 3.3.

Name/Agency	Letter Number	Comment Category	Comment Subcategory	Comments	Response
Natural Resources Defense Council (NRDC)	NGO-026.89	Seabird	Sonar	Ability (of seabirds) to flee (3.3-14) does not mean that they will not be impacted. Long-term displacement would be an impact of its own.	Dispersal of seabirds to areas without disturbance would be a temporary event to individual birds (phenomena commonly accepted in the literature), rather than long-term displacement that could affect birds on a population level. Both land and sea birds move constantly, whether to seek food and shelter or avoid disturbance and predators. Hence, the potential for an occasional disturbance to individual birds is not considered an acoustic effect.
North Carolina Wildlife Resources Commission (NCWRC) / Dunn, Maria T.	S-005.2	Seabird	Sonar	Seabirds do hear in sonar frequency range and would be exposed during dives. Impacts to bird's prey population and hard bottom habitat is also of concern.	An extensive search was performed on the hearing abilities of seabirds. Based on available literature, there was no indication that seabirds will be impacted by mid-range sonar (see Subchapters 3.3.2.5). There is also no indication that the construction and operation of the USWTR would result in or contribute to depletion of prey or hard bottom habitat. Hence, the analysis contained in the EIS covers potential impacts that could reasonably be anticipated from the proposed action.

Name/Agency	Letter Number	Comment Category	Comment Subcategory	Comments	Response
Citizens Opposing Active Sonar Threats (COAST) / Wray, Russell	NGO-025.21	Seabirds	Sonar	Flawed logic in multiple claims that negative impacts over brief periods are not significant, contact could still occur.	In the absence of any of evidence showing that seabirds are influenced by sound, the amount of time they are exposed is minor consideration, although it was included as a factor of why seabirds are unlikely to be affected by sound in a NMFS study (NMFS, 2003). Seabirds spend very little of their time underwater. Subchapter 3.3.2.6.: "Seabirds were excluded from further analysis from an acoustic perspective because while it is likely that many diving birds can hear midfrequency sound, there is no evidence that seabirds use sound underwater, or are deterred by sound."
NY Whale and Dolphin Action League / Williams, Taffy	NGO-018.4	Socioeconomic Impacts	Divers	Whale watching tours will be impacted by loss of whales.	Please refer to the new Subchapter 4.4.6, added to address impact to ecotourism (including whale watching industry).
PenderWatch & Conservancy / Spruill, John R.	NGO-004.6	Socioeconomic Impacts	Fishermen	The DEIS inadequately discusses the impact on recreational and commercial fishing activities on the NC coast.	Please refer to Subchapters 4.4.2 and 4.4.3.
NY Whale and Dolphin Action League / Williams, Taffy	NGO-018.3	Socioeconomic Impacts	Fishermen	Commercial and sport fishing will be impacted by loss of fish due to USWTR.	As presented in Subchapter 4.8.3.1, there will not be a significant impact to fish population due to USWTR operation. Commercial and recreational fishing will not be impacted by the operation of USWTR; see Subchapters 4.4.2 and 4.4.3.

Name/Agency	Letter Number	Comment Category	Comment Subcategory	Comments	Response
PenderWatch & Conservancy / Anonymous	NGO-023.1	Socioeconomic Impacts	Fishermen	USWTR will likely impact fisheries.	The EIS represents the best available and most applicable science. As presented in Subchapter 4.8.3.1, there will not be a significant impact to fish populations due to USWTR operation.
Natural Resources Defense Council (NRDC)	NGO-026.91	Socioeconomic Impacts	Fishermen	DEIS does not consider impacts to wildlife-dependent recreational interests.	Please refer to the text in Subchapter 4.4.3.
Caruso, William	P-003.3	Socioeconomic Impacts	Fishermen	"Bubba's" Kingfish tournament is in the area of Site A range, interference is possible.	The Navy are aware of the AT&T Greater Jacksonville Kingfish Tournament and Festival. Every attempt would be made to schedule training away from recreational fishing events.
Caruso, William	P-003.4	Socioeconomic Impacts	Fishermen	Concern for disruption of commercial fishing around Site A range.	Commercial and recreational fishing will not be impacted by the operation of USWTR; see Subchapters 4.4.2 and 4.4.3.
Anonymous	P-007.1	Socioeconomic Impacts	Fishermen	Concern for impact to fishing businesses in VA.	Commercial and recreational fishing will not be impacted by the operation of USWTR; see Subchapters 4.4.2 and 4.4.3.

Name/Agency	Letter Number	Comment Category	Comment Subcategory	Comments	Response
Frazier, Bruce	P-008.1	Socioeconomic Impacts	Fishermen	Concern for restriction on entry to USWTR site for fishermen in VA.	Commercial and recreation fishing will not be excluded from the USWTR. Please refer to Subchapter 4.4.2.2. Commercial and recreational fishing will not be impacted by the operation of USWTR; see Subchapters 4.4.2 and 4.4.3.
Sellard, Sam	P-009.2	Socioeconomic Impacts	Fishermen	Concern for exclusion of public from USWTR area.	The public will not be excluded from the USWTR. See Subchapter 4.4.
Thomas, Dennis	P-023.2	Socioeconomic Impacts	Fishermen	As the Pentagon assesses threats to national security due to environmental degradation, the threat to national security due to ocean degradation due to warfare training should be addressed.	Comment noted.
Hass, Marsha	P-030.2	Socioeconomic Impacts	Fishermen	SC recreational fisheries already face a "closed area" and a four month closed season.	Comment noted. Commercial and recreational fishing will not be impacted by the operation of USWTR; see Subchapters 4.4.2 and 4.4.3.
Anonymous	P-031.3	Socioeconomic Impacts	Fishermen	Charleston alternative overlaps key recreation and commercial fishing spots (pelagic and reef-dwelling species), impact or restrictions from USWTR may affect or shut down local businesses.	Commercial and recreational fishing will not be impacted by the operation of USWTR; see Subchapters 4.4.2 and 4.4.3. The distribution of popular fishing areas was considered in the impact analysis.

Name/Agency	Letter Number	Comment Category	Comment Subcategory	Comments	Response
Patterson, Brian	P-036.2	Socioeconomic Impacts	Fishermen	Concern for sparse accounting of the effects of USWTR on fisheries - including direct effects on fish and socioeconomic impacts on commercial and charter fisheries.	Commercial and recreational fishing will not be impacted by the operation of USWTR; see Subchapters 4.4.2 and 4.4.3.
Booher, Sam	P-040.12	Socioeconomic Impacts	Fishermen	GA fisheries (including shrimp and crab) have a significant impact on the state's economy. The DEIS grossly underestimate the impact to species these fisheries depend on.	Commercial and recreational fishing will not be impacted by the operation of USWTR; see Subchapters 4.4.2 and 4.4.3.
Booher, Sam	P-040.8	Socioeconomic Impacts	Fishermen	The Navy should interview fishermen about witness accounts of effects to marine life after sonar training.	Please refer to Popper, 2008, available on the USWTR public Web site. Subchapter 4.3.3 of Popper, 2008 details MFA sonar impact studies on fish and concludes no likely impacts from MFA.
Anonymous	P-045.1	Socioeconomic Impacts	Fishermen	Closings due to USWTR activities will drive charter boats out of business, causing expanding economic problems with impacts to tackle shops, tourist industry, marinas, and charity events.	Commercial and recreation fishing will not be excluded from the USWTR. Please refer to Subchapter 4.4.2.2. Commercial and recreational fishing will not be impacted by the operation of USWTR; see Subchapters 4.4.2 and 4.4.3.

Name/Agency	Letter Number	Comment Category	Comment Subcategory	Comments	Response
Shields, Brenda	P-060.2	Socioeconomic Impacts	Fishermen	Concern for impact of USWTR on commercial and recreational fishing.	Commercial and recreational fishing will not be impacted by the operation of USWTR; see Subchapters 4.4.2 and 4.4.3.
Kauskis, Ed	P-063.3	Socioeconomic Impacts	Fishermen	Fishing boats do go to 'the roll down', the area where USWTR is planned; contrary to Navy claims. USWTR would take that area from fishermen.	Commercial and recreation fishing will not be excluded from the USWTR. Please refer to Subchapter 4.4.2.2. Commercial and recreational fishing will not be impacted by the operation of USWTR; see Subchapters 4.4.2 and 4.4.3.
Tracy, Alison	P-064.2	Socioeconomic Impacts	Fishermen	Concern for commercial fishing off of FL - ecological impact from USWTR could impact fisheries.	Please refer to Popper, 2008, available on the USWTR public Web site. Subchapter 4.3.3 of Popper, 2008 details MFA sonar impact studies on fish and concludes no likely impacts from MFA. Installation of range equipment will not have any noticeable effect on fish stocks.
Alsentzer, Mary and Ulrich	P-066.6	Socioeconomic Impacts	Fishermen	DEIS has not adequately addressed the economic impact on recreation and commercial fishing businesses in NC.	Commercial and recreational fishing will not be impacted by the operation of USWTR; see Subchapters 4.4.2 and 4.4.3.
Martin, Tim	P-078.1	Socioeconomic Impacts	Fishermen	Concern for USWTR effect on public boating/fishing if frequent closures, or impact to fish populations occur.	Commercial and recreation fishing will not be excluded from the USWTR. Please refer to Subchapter 4.4.2.2. Commercial and recreational fishing, and recreational boating will not be impacted by the operation of USWTR; see Subchapters 4.4.2, 4.4.3 and 4.4.4.

Name/Agency	Letter Number	Comment Category	Comment Subcategory	Comments	Response
Martin, Tim	P-078.2	Socioeconomic Impacts	Fishermen	Areas of Jacksonville USWTR range are used extensively by the boating public year-round.	Commercial and recreation fishing will not be excluded from the USWTR. Please refer to Subchapter 4.4.2.2. Commercial and recreational fishing, and recreational boating will not be impacted by the operation of USWTR; see Subchapters 4.4.2, 4.4.3 and 4.4.4.
Alsentzer, Dorothée A.	P-083.4	Socioeconomic Impacts	Fishermen	USWTR may impact to tourism and fishing industries, without positive environmental or economical impacts.	See revised text in Subchapter 4.4 - Ecotourism. Avoidance of fishing grounds is a factor in Alternative selection (see Subchapter 2.3.4.5). Predicted effects on commercial fisheries examined in Subchapter 4.4.2 and 4.4.3.
Neal, Tyler	P-087.3	Socioeconomic Impacts	Fishermen	Concern for 'fragile' recreational fishing industry if fish are disturbed.	Please refer to Popper, 2008, available on the USWTR public Web site. Subchapter 4.3.3 of Popper, 2008 details MFA sonar impact studies on fish and concludes no likely impacts from MFA. Installation of range equipment will not have any noticeable effect on fish stocks.
Neal, Tyler	P-087.5	Socioeconomic Impacts	Fishermen	Impact to recreational fishing would have impacts on rest of local economy.	Commercial and recreational fishing will not be impacted by the operation of USWTR; see Subchapters 4.4.2 and 4.4.3.
NASA / Campbell, John H.	F-002.2	Socioeconomic Impacts	NASA	[vs. Navy's claim that NASA is overstating the impact to airspace]. NASA launches both rockets and piloted/unpiloted aircraft for purpose of studying weather phenomena	Comment noted.

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NASA / Campbell, John H.	F-002.3	Socioeconomic Impacts	NASA	Sect 4.8-10 asserts that no major NASA launches are planned for Wallops, but on there are monthly major rocket launches, and weekly sorties of uninhabited aerial systems. Launches are set to increase as Wallops has been assigned further launches for exploration research. Delays cost thousands of dollars per day.	Comment noted.
Caruso, William	P-003.2	Socioeconomic Impacts	Vessel Traffic	Expansion of Port of Jacksonville - increased traffic on strict schedule may not be compatible with Navy's schedule.	There are no commercial shipping lanes through USWTR. The Navy does not expect an increase in ship traffic due to USWTR.
Edwards, Leslie	P-097.1	Socioeconomic Impacts	Divers	Concern for impact to FL economy from loss of whales.	There is no expected mortality of marine mammals due to USWTR activities. Please refer to the Subchapter 4.4.6 which addresses the potential impact to ecotourism (including whale watching industry).

Name/Agency	Letter Number	Comment Category	Comment Subcategory	Comments	Response
FL Department of Environmental Protection (FLDEP) / Griffin, Lynn (General)	S-020.9	Socioeconomic Impacts	Fisherman	Please explain why part of the proposed project is located in international waters? Why was the Exclusive Economic Zone (EEZ) not included in the analysis of the proposed project's boundaries? The next to last paragraph stated the Navy could issue notice to mariners, advising of potentially hazardous operations, but the next paragraph states that the USWTR operations would have to avoid shipping vessels transiting through the range. Please explain. How many notices to mariners would be issued each year? At the open house, it was suggested that recreational and commercial fishing does occur in the proposed project area. Would this notice exclude recreational and commercial fishermen from using the area?	USWTR is located within the U.S. EEZ and not international waters, as incorrectly reported in portions of the DEIS. Please refer to Subchapter 1.5 for a discussion of how Executive Order 12114 applies to the analysis of USWTR. In addition, refer to Subchapter 4.4.2.2 regarding Notices to Mariners, which would only be used if deemed necessary. No restricted areas of navigation are proposed to be implemented for the USWTR, so the Navy would be required to wait for recreational and commercial vessels to clear the range area prior to commencement of training exercises.

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FL Department of Environmental Protection (FLDEP) / Griffin, Lynn (General)	S-020.11	Socioeconomic Impacts	Fisherman	Please completely describe the construction methods that will be used to bring the trunk cable onshore at Mayport Naval Station? When will the decision be made that the trunk cable or interconnect cables should be buried or not? If it is to be buried, and the local bottom type is too hard to cut, what burial alternatives are available?	The text for Chapter 2 of the FEIS has been revised and can help address this comment. See subchapter 4.2.3 of the FEIS for a description of construction impacts.
FL Fish and Wildlife Conservation Commission (FFWCC) / Poole, Mary Ann	S-021.30	Socioeconomic Impacts	Fisherman	Concern #10: The DEIS states that anchoring and trawling is proposed to be prohibited within the boundaries of USWTR Site A, but it is not clear if certain hook and line or other fishing gear types (other than bottom trawls) will be prohibited, such as shark bottom long lines, already prohibited in the North Florida MPA. Recommendation #10: Please provide additional information in the EIS on the types of fishing gears that would be prohibited or permitted within the boundaries of the proposed USWTR.	Please refer to Subchapter 4.4.2.3 of the EIS. Anchoring and trawling in USWTR will not be prohibited, nor will hook and line fishing.

Name/Agency	Letter Number	Comment Category	Comment Subcategory	Comments	Response
FL Fish and Wildlife Conservation Commission (FFWCC) / Poole, Mary Ann	S-021.31	Socioeconomic Impacts	Fisherman	Concern #11: The DEIS presents a weak case for predicting no significant behavioral effects on deepwater grouper-snapper complexes. If the acoustic sounds drive fish away or otherwise behaviorally impair them as in forming spawning aggregations, etc, that would be problematic especially for a special area specifically set aside as a designated marine protected area. All aspects of their deep reef natural ecology should be protected to the extent possible. Section 4.3.11 of this DEIS does not make that case for deepwater grouper-snapper complexes. Recommendation #11: The EIS should include a discussion with greater emphasis on the acoustic effects of the proposed USWTR on deepwater grouper-snapper complexes. More research is needed on the subject in order to definitely support the italic statement at the conclusion of Section 4.3.11.	The Navy is currently undertaking Essential Fish Habitat (EFH) consultation with the Southeast Regional Office of the National Marine Fisheries Service. The best available science was used in the development of the EIS and the analysis of potential impacts to fishes.

Name/Agency	Letter Number	Comment Category	Comment Subcategory	Comments	Response
USEPA / Mueller, Heinz J.	F-005.4	Solid and Hazardous Waste	Debris	ICMP should be expanded to study and minor impacts of expended materials, similar to Nanoose Bay. This can be included in the ICMP for JAX range complex. Results would support conclusions of EIS.	The ICMP has been defined by N45/USFF/NAVFAC Atlantic as relevant only to MMPA and ESA issues involving Marine Mammals and Sea Turtles. However, the Navy has recently implemented the Water Range Sustainability Environmental Program Assessment (WRSEPA) Policy (29 Aug 08) to ensure the long-term viability of our operational ranges while protecting human health and the environment; and to develop a written operational range assessment plan that details the process and procedures to assess operational ranges. The finalization of the overall ICMP will not be completed until late 2009.
Duke Environmental Law & Policy Clinic	NGO-012.39	Solid and Hazardous Waste	Debris	Urges recovery of spent materials, or explanation of why they cannot be recovered. USCG aims to eliminate the dumping of plastics into the ocean.	The Navy minimizes the accumulation of debris as much as possible. Sonobuoys and parachutes are designed to sink after use; therefore, it would be extremely difficult to retrieve them. Please refer to the Coastal Conservancy Debris report (found at www.oceanconservancy.org): Military debris is a very small component of total debris released into the ocean.
Southern Environmental Law Center / Wannamaker, Catherine M.	NGO-017.42	Solid and Hazardous Waste	Debris	DEIS fails to quantify the impact of discarded sonobuoys on the quality of the benthic habitat, and provides no data on the corrosion of the sonobuoys.	Please refer to revised Subchapter 4.1.

Name/Agency	Letter Number	Comment Category	Comment Subcategory	Comments	Response
Southern Environmental Law Center / Wannamaker, Catherine M.	NGO-017.43	Solid and Hazardous Waste	Debris	Parachutes, ballast and debris can harm hard bottom and coral habitat quality.	Please refer to revised Subchapter 4.1.
Earthjustice / Renshaw, Katie	NGO-019.8	Solid and Hazardous Waste	Debris	Discussion of environmental effects of debris is limited and fails to consider cumulative effects - counter to 40 C.F.R. § 1508.7.	The Navy would minimize the accumulation of debris as much as possible, as summarized in Subchapters 4.1 and 4.2. The analysis (within subchapters 4.1 and 4.2) determined that no significant impact from expended materials will occur. Subchapter 4.1 discusses the long-term effects of discarding materials, whose retrieval could have negative environmental impacts on surrounding habitat. The EIS uses the best available and most applicable science to assess the effects of expended materials on the marine environment.
Citizens Opposing Active Sonar Threats (COAST) / Wray, Russell	NGO-025.6	Solid and Hazardous Waste	Debris	Multiple claims of no significant harm from debris is unjustified, especially when cumulative effects are considered.	The revised and expanded Subchapter 4.1.1.3 discusses the long-term effects of discarding materials, whose retrieval could have negative environmental impacts on surrounding habitat.

Name/Agency	Letter Number	Comment Category	Comment Subcategory	Comments	Response
North Carolina Division of Marine Fisheries (NCDMF) / Duval, Michelle	S-006.2	Solid and Hazardous Waste	Debris	Concern about the impact of unrecovered materials, despite conclusions of the DEIS EFH assessment.	The Navy would minimize the accumulation of debris as much as possible, as summarized in Subchapters 4.1 and 4.2. The analysis determines that no significant impact from expended materials will occur. Subchapter 4.1 discusses the long-term effects of discarding materials, whose retrieval could have negative environmental impacts on surrounding habitat. The EIS uses the best available and most applicable science to assess the effects of expended materials on the marine environment.
NC Marine Fisheries Commission / Currin, Mac	S-008.2	Solid and Hazardous Waste	Debris	EIS should acknowledge adverse impact of unrecovered training targets on fish habitats.	Impact of debris to EFH is discussed in Subchapter 4.2.3. The Navy minimizes the discharge of debris to the maximum extent possible.
VA Dept of Game and Inland Fisheries (VDGIF) / Ewing, Amy	S-015.7	Solid and Hazardous Waste	Debris	Debris will have a cumulative adverse effect on wildlife and fisheries. Due diligence must be taken in retrieval.	The Navy would minimize the accumulation of debris as much as possible, as summarized in Subchapters 4.1 and 4.2. The analysis (within subchapters 4.1 and 4.2) determined that no significant impact from expended materials will occur. Subchapter 4.1 discusses the long-term effects of discarding materials, whose retrieval could have negative environmental impacts on surrounding habitat. The EIS uses the best available and most applicable science to assess the effects of expended materials on the marine environment.

Name/Agency	Letter Number	Comment Category	Comment Subcategory	Comments	Response
FL Department of Environmental Protection (FLDEP) / Griffin, Lynn (General)	S-020.25	Solid and Hazardous Waste	Debris	What impact will the expendable materials from torpedoes that do not degrade have on the surrounding habitat? Is there possibility for entanglement or ingestion by fish, mammals, or turtles? Please provide reference that the non-inert materials would degrade, corrode, and become incorporated into the sediments. What is the timeframe for incorporation into the sediments?	Please refer to the revised text for Subchapter 4.1.1.2. Reference is made in the revisions to information obtained from the Dabob Bay Range Complex study and the Nanoose study (both found on the attached CD). Both of these studies demonstrated that long term effects of marine expended materials, such as those to be utilized on the proposed USWTR, would have negligible long-term effects.
FL Department of Environmental Protection (FLDEP) / Griffin, Lynn (General)	S-020.26	Solid and Hazardous Waste	Debris	Please provide references that the sonobuoys would degrade, corrode, and become incorporated into the sediments. What is the timeframe for incorporation into the sediments?	Please refer to the revised text for Subchapter 4.1.1.2. Reference is made in the revisions to information obtained from the Dabob Bay Range Complex study and the Nanoose study (both found on the attached CD). Both of these studies demonstrated that long term effects of marine expended materials, such as those to be utilized on the proposed USWTR, would have negligible long-term effects.

Name/Agency	Letter Number	Comment Category	Comment Subcategory	Comments	Response
FL Department of Environmental Protection (FLDEP) / Griffin, Lynn (General)	S-020.27	Solid and Hazardous Waste	Debris	Please provide references that the targets or EMATTs would degrade, corrode and become incorporated into the sediments. How many years would this process take?	Please refer to the revised text for Subchapter 4.1.1.2. Reference is made in the revisions to information obtained from the Dabob Bay Range Complex study and the Nanoose study (both found on the attached CD). Both of these studies demonstrated that long term effects of marine expended materials, such as those to be utilized on the proposed USWTR, would have negligible long-term effects.
FL Department of Environmental Protection (FLDEP) / Griffin, Lynn (General)	S-020.30	Solid and Hazardous Waste	Debris	While unburied transducers may provide substrate for some organisms, artificial hard substrate does not have the same replacement value as natural hardbottom.	Comment noted.
FL Department of Environmental Protection (FLDEP) / Griffin, Lynn (General)	S-020.32	Solid and Hazardous Waste	Debris	Please provide the state with a copy of the reference DoN, 2008a (EIS/OEIS Undersea Warfare Training Range, Essential Fish Habitat. Technical Report. [2008 Revision of (Department of the Navy 2007a)]).	This report is updated and is now titled "Essential Fish Habitat Assessment for the Environmental Impact Statement/Overseas Environmental Impact Statement, Undersea Warfare Training Range." It has been included on the attached CD.

Name/Agency	Letter Number	Comment Category	Comment Subcategory	Comments	Response
FL Department of Environmental Protection (FLDEP) / Griffin, Lynn (General)	S-020.37	Solid and Hazardous Waste	Debris	Are there any anticipated impacts from ingestion of any of the materials that are considered expendable. The only discussion of ingestion concerned the parachutes. Is there a possibility of accidental ingestion of the other expendable materials (wires, flex hoses, etc.) by sea turtles and/or marine mammals?	Due to the large size of both the flex hoses (250 ft. in length) and torpedo control wires (which vary in length, but can be miles long), ingestion of these items was not anticipated or analyzed in the EIS. Aside from their large size, these items are not likely to be mistaken for prey items for marine organisms.
Duke Environmental Law & Policy Clinic	NGO-012.13	Solid and Hazardous Waste	Entanglement	DEIS claim that parachutes are too large to be a threat is incorrect, as pieces larger than parachutes have been found within turtles. Must correct DEIS analysis and consider potential mitigation.	Please refer to Subchapter 4.2.4.5: Parachutes used are large in comparison with turtles' normal food items, and would be very difficult to ingest. The Navy is consulting with the NMFS regarding impacts to ESA species and the required mitigation.
Southern Environmental Law Center / Wannamaker, Catherine M.	NGO-017.44	Solid and Hazardous Waste	Toxicity	Ballast can leach lead and other toxins, which can destroy hard bottom and coral habitat. SAFMC prohibits use of any toxic chemicals.	As discussed in USWTR Subchapter 4.1.2.2, the lead ballasts are covered by a steel jacket. As described in the FEIS (Subchapter 4.1.2.2), the lead of the ballast weights is unlikely to mobilize into the sediment or water. In addition, as one of its environmental readiness requirements and goals, the Navy has implemented measures to minimize the use of toxic and hazardous materials and chemicals that pose the greatest environmental risks (DoN, 2008e).

Name/Agency	Letter Number	Comment Category	Comment Subcategory	Comments	Response
Southern Environmental Law Center / Wannamaker, Catherine M.	NGO-017.70	Solid and Hazardous Waste	Toxicity	Navy should use steel or iron ballast instead of lead, to reduce potential toxin release.	As discussed in Subchapter 4.1.2.2, the lead ballast is contained in a steel jacket, which reduces the potential release of lead. Navy policy (DoN, 2008e) is to minimize the use of toxic and hazardous materials and chemicals that pose the greatest environmental risks.
Carter, Larry	P-088.4	Solid and Hazardous Waste	Toxicity	Concern for dumped military ordinances and chemicals in USWTR area that may be disturbed by construction.	Prior to the enactment of the Marine Protection, Research, and Sanctuaries Act in 1972, the disposal of chemical weapons in the ocean was not regulated. In 2001, the Army published records which included exact coordinates for only a few chemical weapons disposal sites. Eleven sites appear to be in the vicinity of the Atlantic region (U.S. Army, 2001). Chemical agents disposed of in the vicinity of the Atlantic region include: arsenic trichloride, lewsite, mustard gas, nerve gas, and white phosphorus. There are no known disposal areas in the vicinity of any of the four USWTR sites. The bottom survey that will be performed prior to cable installation would be used to identify any evidence of chemical disposal areas.

Name/Agency	Letter Number	Comment Category	Comment Subcategory	Comments	Response
North Carolina Wildlife Resources Commission (NCWRC) / Dunn, Maria T.	S-005.4	Solid and Hazardous Waste	Toxicity	Contrary to belief of no significant biomagnification, Lead could become concentrated in benthic organisms, and could become magnified enough in secondary or tertiary consumers to cause health issues.	As discussed in Subchapter 4.1.2.2, the lead ballast is contained in a steel jacket, which reduces the potential release of lead. The amount of lead that would be released by equipment associated with USWTR is negligible [compared to the amount of lead already released by other human activities] and well below concentrations that would impact aquatic life. The USEPA has not established a criteria for lead in organisms consumed by humans (USEPA, 2006). Due to the very small release of lead entering the environment from USWTR equipment and the very low bioavailability of lead, the risk to secondary and tertiary consumers from bioaccumulation of lead are not expected to cause health effects, as discussed in the EIS.
VADEQ Waste Division / Kohler, Paul	S-O17.1	Solid and Hazardous Waste	Toxicity	Shore-based facility at Wallops Island is designated as a DEQ Federal Facilities Installation Restoration Program, a Formerly Used Defense Site, a RCRA treatment, storage, and disposal facility and a large quantity generator of hazardous water.	Comment noted.

Name/Agency	Letter Number	Comment Category	Comment Subcategory	Comments	Response
VADEQ Waste Division / Kohler, Paul	S-O17.2	Solid and Hazardous Waste	Toxicity	Any soil suspected of contamination or wastes generated must be tested and disposed of in accordance with applicable laws and regulations	Comment noted.
FL Department of Environmental Protection (FLDEP) / Griffin, Lynn (General)	S-020.7	Solid and Hazardous Waste	Toxicity	It is stated that materials left in place are not expected to result in any significant degradation of the environment. Please provide MSDS sheets on all materials expected to be expendable and references to support the statement.	The Navy is making every effort to minimize waste materials during installation and operation of the range (refer to Subchapter 4.1), and will adhere to all relevant regulatory requirements regarding mitigation of impacts. Material Safety Data Sheets (MSDSs) are documents containing information on the potential effects on human health from exposure to chemicals. MSDSs describe possible hazards involved with the chemicals/products, how to use them safely, what to do when accidents occur, and how to recognize symptoms of overexposure. This information is not relevant to Subchapter 4.1.2 of the FEIS, which discusses potential releases of toxic materials to the ocean environment and potential effects on marine organisms. The analysis provided in the FEIS indicates that expended materials pose negligible risks to marine organisms.

Name/Agency	Letter Number	Comment Category	Comment Subcategory	Comments	Response
FL Department of Environmental Protection (FLDEP) / Griffin, Lynn (General)	S-020.8	Solid and Hazardous Waste	Debris	Although the material left in place may not pose a hazard as it decomposes, could accidental ingestion occur? What is the likely hood that these materials may resemble food sources for ESA species?	Please refer to Subchapter 4.2.4.5. Parachutes used are large in comparison with turtles' normal food items, and would be very difficult to ingest.

APPENDIX I

DISTRIBUTION LIST

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I DISTRIBUTION LIST

The individuals, agencies, and organizations listed below received a copy of the Undersea Warfare Training Range (USWTR) draft and final Overseas Environmental Impact Statement/Environmental Impact Statement (OEIS/EIS). Please note that not all states have a clearinghouse. For states not having a clearinghouse, a copy of the USWTR final OEIS/EIS was sent to the most relevant state agency. Following this list is a list of stakeholders: individuals, agencies, and organizations which received notification of the availability of the USWTR draft and final OEIS/EIS and announcement of public hearings. A copy of the notification letter is provided at the end of this appendix.

Since the release of the USWTR draft OEIS/EIS, the points of contact at some of the agencies and organizations have changed; therefore, the distribution lists have been updated to reflect these changes. Although the points of contact may have changed, the same agencies and organizations received a copy of both the draft and final OEIS/EIS.

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STAKEHOLDER LIST

Postcards or official Navy letters were disseminated to individuals, agencies, and organizations listed below. These acted as formal notification of the availability of the USWTR draft and final OEIS/EIS and announcement of public hearings. An example of the postcard is located at the end of this list.

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Robert Ford Senator South Carolina Senate- District 42 506 Gressette Building Columbia, SC 29201	George Campsen III Senator South Carolina Senate- District 43 604 Gressette Building Columbia, SC 29201
Clementa Pinckney Senator South Carolina Senate- District 45 512 Gressette Building Columbia, SC 29201	Thomas Davis Senator South Carolina Senate- District 46 602 Gressette Building Columbia, SC 29201
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Annette Young Representative South Carolina House of Representatives- District 98 308C Blatt Building Columbia, SC 29201	Gregory Delleney, Jr. Representative South Carolina House of Representatives- District 43 532C Blatt Building Columbia, SC 29201
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Kent Ware Hatchery Manager Bears Bluff National Fish Hatchery P.O. Box 69 7030 Bears Bluff Road Wadmalaw Island, SC 29487	Mark Purcell Refuge Manager Ernest F. Hollings ACE Basin National Wildlife Refuge P.O. Box 848 Hollywood, SC 29449

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Notice of Availability and Public Hearing on the Draft Overseas Environmental Impact Statement (OEIS)/Environmental Impact Statement (EIS) for the Undersea Warfare Training Range

The US Navy will host a public information session and a public hearing for the OEIS/EIS that was prepared regarding the Navy's proposal to establish an Undersea Warfare Training Range (USWTR) offshore of the east coast of the United States. The USWTR would be a 500-square-nautical-mile (NM^2) area of the ocean instrumented with undersea cables and sensor nodes and used for anti-submarine warfare (ASW) training. Interested members of the public are urged to attend to learn about the project and the EIS, and to offer their comments. Written comments will be taken at both the public information session and at the hearing. Oral comments can be made at the hearing and will be limited to three (3) minutes per speaker.

September 29, 2008	**The Chincoteague Center** 6155 Community Drive Chincoteague, VA 23336 Public information session: 4:00-7:00 p.m.; Public hearing: 7:00-9:00 p.m.
October 1, 2008	**Crystal Coast Civic Center** 3505 Arendell Street Morehead City, NC 28557 Public information session: 6:00-8:00 p.m.; Public hearing: 8:00-10:00 p.m.
October 6, 2008	**The Sheraton North Charleston – Convention Center** 4770 Goer Drive North Charleston, SC 29406 Public information session: 5:00-7:00 p.m.; Public hearing: 7:00-9:00 p.m.
October 7, 2008	**The UNF University Center** 12000 Alumni Drive Jacksonville, FL 32224-2678 Public information session: 5:00-7:00 p.m.; Public hearing: 7:00-9:00 p.m.

The environmental impact statement is available to the public on the Internet at http://projects.earthtech.com/USWTR/ and at the following locations:

Virginia Beach Central Library
4100 Virginia Beach Boulevard
Virginia Beach, VA 23452

Eastern Shore Public Library
23610 Front Street
Accomac, VA 23301

Chincoteague Island Library
4077 Main Street
Chincoteague Island, VA 23336

Worcester County Library
Ocean City Branch
10003 Postal Highway
Ocean City, MD 21842

Wicomico County Free Library
122 South Division Street
Salisbury, MD 21801

Carteret County Public Library
210 Turner Street
Beaufort, NC 28516

Onslow County Public Library
58 Doris Avenue East
Jacksonville, NC 28540

Charleston County Public Library
68 Calhoun Street
Charleston, SC 29401

Jacksonville Public Library
Regency Square Branch
9900 Regency Boulevard
Jacksonville, FL 32225

The public comment period lasts until **October 27, 2008**. Comments can be sent to:
Naval Facilities Engineering Command Atlantic
ATTENTION: Code EV22LL (USWTR OEIS/EIS PM)
6506 Hampton Boulevard
Norfolk, Virginia 23508-1278

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