

**APPENDIX E**  
**Estimated Marine Mammals and Sea Turtle Impacts from**  
**Exposure to Acoustic and Explosive Stressors Under Navy**  
**Training and Testing Activities**

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**Final  
Environmental Impact Statement/Overseas Environmental Impact Statement  
Atlantic Fleet Training and Testing**

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## **APPENDIX E ESTIMATED MARINE MAMMALS AND SEA TURTLE IMPACTS FROM EXPOSURE TO ACOUSTIC AND EXPLOSIVE STRESSORS UNDER NAVY TRAINING AND TESTING ACTIVITIES**

Navy training and testing activities would result in the incidental takes of marine mammals and sea turtles within the Study Area. The following appendix provides the estimated number of marine mammal and sea turtle impacts. Specifically, estimated impacts are derived from the quantitative analysis for activities under Alternatives 1 and 2 that involve the use of acoustic or explosive stressors. The quantitative analysis takes into account Navy activities, marine species density layers, acoustic modeling and other environmental parameters. A detailed explanation of the quantitative analysis is provided in the technical report *Quantifying Acoustic Impacts on Marine Mammals and Sea Turtles: Methods and Analytical Approach for Phase III Training and Testing* (U.S. Department of the Navy, 2018). It is important to note that *impacts*, as discussed in this appendix, represent the estimated instances of take of marine mammals or sea turtles, not necessarily the number of individuals impacted (i.e., some marine mammals or sea turtles could be impacted several times, while others would not experience any impact). In addition, across training and testing activities, the five-year total impacts in each table may be more or less than the sum total of each year, given that; not all activities occur every year; some activities occur multiple times within a year; and some activities only occur a few times over the course of a 5-year period.

### **E.1 ESTIMATED MARINE MAMMALS IMPACTS FROM SONAR AND OTHER TRANSDUCERS UNDER NAVY TRAINING ACTIVITIES**

Table E.1-1 provides a summary of the estimated number of marine mammal impacts from exposure to sonar and other transducers used during Navy training activities under Alternatives 1 and 2 over the course of a year.

**Table E.1-1: Estimated Marine Mammal Impacts per Year from Sonar Training Activities**

Species	Stock	Alternative 1 – Minimum			Alternative 1 – Maximum			Alternative 2		
		Behavioral Response	TTS	PTS	Behavioral Response	TTS	PTS	Behavioral Response	TTS	PTS
Suborder Mysticeti (baleen whales)										
Family Balaenidae (right whales)										
North Atlantic right whale*	Western North Atlantic	102	113	0	116	121	0	104	122	0
Family Balaenopteridae (roquals)										
Blue whale*	Western North Atlantic (Gulf of St. Lawrence)	8	15	0	8	18	0	10	22	0
Bryde's whale	Northern Gulf of Mexico	0	0	0	0	0	0	5	18	0
	NSD <sup>†</sup>	49	132	0	53	151	0	62	190	0
Minke whale	Canadian East Coast	453	1,670	0	482	1,930	0	570	2,448	1
Fin whale*	Western North Atlantic	517	884	0	533	933	0	679	1,242	0
Humpback whale	Gulf of Maine	64	138	0	68	151	0	74	180	0
Sei whale*	Nova Scotia	85	185	0	88	202	0	111	268	0
Suborder Odontoceti (toothed whales)										
Family Physeteridae (sperm whale)										
Sperm whale*	Gulf of Mexico Oceanic	24	0	0	24	0	0	1,691	40	0
	North Atlantic	13,246	306	0	13,753	326	0	16,730	395	0
Family Kogiidae (sperm whales)										
Dwarf sperm whale	Gulf of Mexico Oceanic	4	9	0	4	9	0	303	732	2
	Western North Atlantic	2,654	4,942	6	2,790	5,714	7	3,401	7,354	9



**Table E.1-1: Estimated Marine Mammal Impacts per Year from Sonar Training Activities (continued)**

<i>Species</i>	<i>Stock</i>	<i>Alternative 1 – Minimum</i>			<i>Alternative 1 – Maximum</i>			<i>Alternative 2</i>		
		<i>Behavioral Response</i>	<i>TTS</i>	<i>PTS</i>	<i>Behavioral Response</i>	<i>TTS</i>	<i>PTS</i>	<i>Behavioral Response</i>	<i>TTS</i>	<i>PTS</i>
Pygmy sperm whale	Northern Gulf of Mexico	4	9	0	4	9	0	303	732	2
	Western North Atlantic	2,654	4,942	6	2,790	5,714	7	3,401	7,354	9
<b><i>Family Ziphiidae (beaked whales)</i></b>										
Blainville's beaked whale	Northern Gulf of Mexico	35	0	0	35	0	0	1,324	18	0
	Western North Atlantic	11,924	91	0	12,430	102	0	15,348	121	0
Cuvier's beaked whale	Northern Gulf of Mexico	34	0	0	34	0	0	1,316	18	0
	Western North Atlantic	44,153	336	0	46,022	375	0	56,798	445	0
Gervais' beaked whale	Northern Gulf of Mexico	35	0	0	35	0	0	1,324	18	0
	Western North Atlantic	11,924	91	0	12,430	102	0	15,348	121	0
Northern bottlenose whale	Western North Atlantic	1,069	1	0	1,072	1	0	1,165	1	0
Sowerby's beaked whale	Western North Atlantic	11,924	91	0	12,430	102	0	15,348	121	0
True's beaked whale	Western North Atlantic	11,924	91	0	12,430	102	0	15,348	121	0
<b><i>Family Delphinidae (dolphins)</i></b>										
Atlantic spotted dolphin	Northern Gulf of Mexico	910	10	0	934	11	0	4,459	263	0
	Western North Atlantic	105,106	7,214	0	110,164	7,703	0	129,196	9,158	0

**Table E.1-1: Estimated Marine Mammal Impacts per Year from Sonar Training Activities (continued)**

<i>Species</i>	<i>Stock</i>	<i>Alternative 1 – Minimum</i>			<i>Alternative 1 – Maximum</i>			<i>Alternative 2</i>		
		<i>Behavioral Response</i>	<i>TTS</i>	<i>PTS</i>	<i>Behavioral Response</i>	<i>TTS</i>	<i>PTS</i>	<i>Behavioral Response</i>	<i>TTS</i>	<i>PTS</i>
Atlantic white-sided dolphin	Western North Atlantic	13,180	828	0	13,592	900	0	17,011	1,145	0
Bottlenose dolphin	Choctawatchee Bay	7	0	0	7	0	0	7	0	0
	Gulf of Mexico Eastern Coastal	0	0	0	42	0	0	0	0	0
	Gulf of Mexico Northern Coastal	213	2	0	213	2	0	1,407	68	0
	Gulf of Mexico Western Coastal	59	2	0	3,617	530	0	110	3	0
	Indian River Lagoon Estuarine System	255	28	0	255	28	0	255	28	0
	Jacksonville Estuarine System	74	10	0	74	10	0	74	10	0
	Mississippi Sound, Lake Borgne, Bay Boudreau	0	0	0	0	0	0	0	0	0
	Northern Gulf of Mexico Continental Shelf	1,523	11	0	1,523	11	0	10,194	492	0
	Northern Gulf of Mexico Oceanic	185	2	0	185	2	0	1,171	56	0

**Table E.1-1: Estimated Marine Mammal Impacts per Year from Sonar Training Activities (continued)**

<i>Species</i>	<i>Stock</i>	<i>Alternative 1 – Minimum</i>			<i>Alternative 1 – Maximum</i>			<i>Alternative 2</i>		
		<i>Behavioral Response</i>	<i>TTS</i>	<i>PTS</i>	<i>Behavioral Response</i>	<i>TTS</i>	<i>PTS</i>	<i>Behavioral Response</i>	<i>TTS</i>	<i>PTS</i>
	Northern North Carolina Estuarine System	969	97	0	2,762	457	0	969	97	0
	Southern North Carolina Estuarine System	0	0	0	0	0	0	0	0	0
	Western North Atlantic Northern Florida Coastal	791	38	0	862	42	0	1,030	49	0
	Western North Atlantic Central Florida Coastal	4,669	250	0	5,055	278	0	5,861	304	0
	Western North Atlantic Northern Migratory Coastal	22,944	1,853	1	23,236	1,883	1	25,436	2,023	1
	Western North Atlantic Offshore	260,221	19,975	9	284,072	22,890	9	306,627	23,312	9
	Western North Atlantic South Carolina/ Georgia Coastal	3,758	163	0	4,131	189	0	5,102	230	0
	Western North Atlantic Southern Migratory Coastal	10,005	482	1	11,705	674	1	12,875	637	1

**Table E.1-1: Estimated Marine Mammal Impacts per Year from Sonar Training Activities (continued)**

<i>Species</i>	<i>Stock</i>	<i>Alternative 1 – Minimum</i>			<i>Alternative 1 – Maximum</i>			<i>Alternative 2</i>		
		<i>Behavioral Response</i>	<i>TTS</i>	<i>PTS</i>	<i>Behavioral Response</i>	<i>TTS</i>	<i>PTS</i>	<i>Behavioral Response</i>	<i>TTS</i>	<i>PTS</i>
Clymene dolphin	Northern Gulf of Mexico	96	3	0	96	3	0	5,262	414	0
	Western North Atlantic	59,741	3,653	0	65,517	4,229	0	76,302	4,835	0
False killer whale	Northern Gulf of Mexico	40	1	0	40	1	0	1,797	126	0
	Western North Atlantic	7,101	394	0	7,806	462	0	9,431	548	0
Fraser's dolphin	Northern Gulf of Mexico	59	0	0	59	0	0	965	51	0
	Western North Atlantic	3,417	174	0	3,735	194	0	4,505	261	0
Killer whale	Northern Gulf of Mexico	1	0	0	1	0	0	79	4	0
	Western North Atlantic	69	3	0	74	3	0	85	4	0
Long-finned pilot whale	Western North Atlantic	15,547	769	0	16,188	845	0	19,650	1,023	0
Melon-headed whale	Northern Gulf of Mexico	68	2	0	68	2	0	5,675	413	0
	Western North Atlantic	31,876	1,762	0	35,103	2,039	0	41,994	2,416	0
Pantropical spotted dolphin	Northern Gulf of Mexico	549	16	0	549	16	0	54,726	4,152	0
	Western North Atlantic	124,754	7,402	0	136,727	8,382	0	163,807	10,173	0
Pygmy killer whale	Northern Gulf of Mexico	16	0	0	16	0	0	1,247	92	0
	Western North Atlantic	5,596	289	0	6,143	338	0	7,302	407	0

**Table E.1-1: Estimated Marine Mammal Impacts per Year from Sonar Training Activities (continued)**

<i>Species</i>	<i>Stock</i>	<i>Alternative 1 – Minimum</i>			<i>Alternative 1 – Maximum</i>			<i>Alternative 2</i>		
		<i>Behavioral Response</i>	<i>TTS</i>	<i>PTS</i>	<i>Behavioral Response</i>	<i>TTS</i>	<i>PTS</i>	<i>Behavioral Response</i>	<i>TTS</i>	<i>PTS</i>
Risso's dolphin	Northern Gulf of Mexico	38	1	0	38	1	0	1,931	140	0
	Western North Atlantic	18,315	996	0	19,878	1,150	0	24,998	1,440	0
Rough-toothed dolphin	Northern Gulf of Mexico	70	1	0	92	5	0	2,404	200	0
	Western North Atlantic	16,562	1,145	0	18,240	1,321	0	22,086	1,608	0
Short-beaked common dolphin	Western North Atlantic	188,458	14,716	0	200,722	17,303	0	253,413	21,443	0
Short-finned pilot whale	Northern Gulf of Mexico	35	1	0	35	1	0	1,293	71	0
	Western North Atlantic	27,798	1,361	0	29,823	1,527	0	36,002	1,783	0
Spinner dolphin	Northern Gulf of Mexico	221	7	0	221	7	0	26,750	2,122	0
	Western North Atlantic	62,660	3,930	0	69,130	4,541	0	82,700	5,473	0
Striped dolphin	Northern Gulf of Mexico	65	2	0	65	2	0	4,972	390	0
	Western North Atlantic	84,576	5,045	0	85,776	5,242	0	102,869	6,427	0
White-beaked dolphin	Western North Atlantic	36	1	0	38	2	0	36	1	0
<b><i>Family Phocoenidae (porpoises)</i></b>										
Harbor porpoise	Gulf of Maine/Bay of Fundy	21,448	6,957	11	22,043	7,147	12	24,835	8,260	13

**Table E.1-1: Estimated Marine Mammal Impacts per Year from Sonar Training Activities (continued)**

Species	Stock	Alternative 1 – Minimum			Alternative 1 – Maximum			Alternative 2		
		Behavioral Response	TTS	PTS	Behavioral Response	TTS	PTS	Behavioral Response	TTS	PTS
Suborder Pinnipedia										
Family Phocidae (true seals)										
Gray seal	Western North Atlantic	416	1,005	0	437	1,007	0	416	1,009	0
Harbor seal	Western North Atlantic	675	1,630	0	708	1,633	0	675	1,636	0
Harp seal	Western North Atlantic	2,678	5,750	1	2,692	5,752	1	2,678	5,751	1
Hooded seal	Western North Atlantic	39	85	0	42	85	0	39	89	0
Order Sirenia										
Family Trichechidae (manatees)										
West Indian manatee*	Florida, Antillean	0	0	0	0	0	0	0	0	0

\* ESA-listed species (all stocks) within the AFTT Study Area

†NSD: No stock designated

PTS: permanent threshold shift; TTS: temporary threshold shift

## E.2 ESTIMATED MARINE MAMMAL IMPACTS PER FIVE YEAR PERIOD FROM SONAR AND OTHER TRANSDUCERS UNDER NAVY TRAINING ACTIVITIES

Table E.2-1 provides a summary of the estimated number of marine mammal impacts from exposure to sonar and other transducers used during Navy training activities under Alternatives 1 and 2 over the course of five years.

**Table E.2-1: Estimated Marine Mammal Impacts per 5-Year Period from Sonar Training Activities**

Species	Stock	Alternative 1 – 5-Year			Alternative 2 – 5-Year		
		Behavioral Response	TTS	PTS	Behavioral Response	TTS	PTS
Suborder Mysticeti (baleen whales)							
Family Balaenidae (right whales)							
North Atlantic right whale*	Western North Atlantic	553	586	0	564	626	0
Family Balaenopteridae (roquals)							
Blue whale*	Western North Atlantic (Gulf of St. Lawrence)	40	81	0	49	111	0
Bryde's whale	Northern Gulf of Mexico	0	0	0	23	88	0
	NSD <sup>†</sup>	255	697	0	312	951	0
Minke whale	Canadian East Coast	2,325	8,871	0	2,852	12,238	3
Fin whale*	Western North Atlantic	2,619	4,518	0	3,400	6,210	0
Humpback whale	Gulf of Maine	330	717	0	377	900	0
Sei whale*	Nova Scotia	429	960	0	554	1,342	0
Suborder Odontoceti (toothed whales)							
Family Physeteridae (sperm whale)							
Sperm whale*	Gulf of Mexico Oceanic	118	0	0	8,456	202	0
	North Atlantic	67,244	1,570	0	83,653	1,974	0
Family Kogiidae (sperm whales)							
Dwarf sperm whale	Gulf of Mexico Oceanic	22	46	0	1,515	3,660	8
	Western North Atlantic	13,543	26,253	33	17,004	36,770	43
Pygmy sperm whale	Northern Gulf of Mexico	22	46	0	1,515	3,660	8
	Western North Atlantic	13,543	26,253	33	17,004	36,770	43

**Table E.2-1: Estimated Marine Mammal Impacts per 5-Year Period from Sonar Training Activities (continued)**

Species	Stock	Alternative 1 – 5-Year			Alternative 2 – 5-Year		
		Behavioral Response	TTS	PTS	Behavioral Response	TTS	PTS
Family Ziphiidae (beaked whales)							
Blainville's beaked whale	Northern Gulf of Mexico	173	0	0	6,621	92	0
	Western North Atlantic	60,631	477	0	76,743	603	0
Cuvier's beaked whale	Northern Gulf of Mexico	172	0	0	6,581	92	0
	Western North Atlantic	224,506	1,759	0	283,996	2,226	0
Gervais' beaked whale	Northern Gulf of Mexico	173	0	0	6,621	92	0
	Western North Atlantic	60,631	477	0	76,743	603	0
Northern bottlenose whale	Western North Atlantic	5,353	7	0	5,827	7	0
Sowerby's beaked whale	Western North Atlantic	60,631	477	0	76,743	603	0
True's beaked whale	Western North Atlantic	60,631	477	0	76,743	603	0
Family Delphinidae (dolphins)							
Atlantic spotted dolphin	Northern Gulf of Mexico	4,623	53	0	22,364	1,320	0
	Western North Atlantic	535,925	37,063	0	646,815	45,830	0
Atlantic white-sided dolphin	Western North Atlantic	66,763	4,287	0	85,168	5,727	0
Bottlenose dolphin	Choctawatchee Bay	33	0	0	33	0	0
	Gulf of Mexico Eastern Coastal	125	0	0	0	0	0
	Gulf of Mexico Northern Coastal	1,063	8	0	7,033	339	0
	Gulf of Mexico Western Coastal	10,969	1,592	0	11,223	1,600	0
	Indian River Lagoon	1,275	139	0	1,275	139	0



**Table E.2-1: Estimated Marine Mammal Impacts per 5-Year Period from Sonar Training Activities (continued)**

<i>Species</i>	<i>Stock</i>	<i>Alternative 1 – 5-Year</i>			<i>Alternative 2 – 5-Year</i>		
		<i>Behavioral Response</i>	<i>TTS</i>	<i>PTS</i>	<i>Behavioral Response</i>	<i>TTS</i>	<i>PTS</i>
	Estuarine System						
	Jacksonville Estuarine System	372	49	0	372	49	0
	Mississippi Sound, Lake Borgne, Bay Boudreau	0	0	0	0	0	0
	Northern Gulf of Mexico Continental Shelf	7,615	54	0	50,970	2,461	0
	Northern Gulf of Mexico Oceanic	923	8	0	5,854	280	0
	Northern North Carolina Estuarine System	10,223	1,567	0	10,223	1,567	0
	Southern North Carolina Estuarine System	0	0	0	0	0	0
	Western North Atlantic Northern Florida Coastal	4,115	201	0	5,199	250	0
	Western North Atlantic Central Florida Coastal	24,234	1,320	0	29,656	1,565	0
	Western North Atlantic Northern Migratory Coastal	115,493	9,340	3	127,753	10,160	3
	Western North Atlantic Offshore	1,359,881	107,210	43	1,566,355	121,070	43
	Western North Atlantic South Carolina/ Georgia Coastal	19,640	879	0	25,821	1,189	0
	Western North Atlantic	54,540	2,947	3	67,722	3,650	3

**Table E.2-1: Estimated Marine Mammal Impacts per 5-Year Period from Sonar Training Activities (continued)**

<i>Species</i>	<i>Stock</i>	<i>Alternative 1 – 5-Year</i>			<i>Alternative 2 – 5-Year</i>		
		<i>Behavioral Response</i>	<i>TTS</i>	<i>PTS</i>	<i>Behavioral Response</i>	<i>TTS</i>	<i>PTS</i>
	Southern Migratory Coastal						
Clymene dolphin	Northern Gulf of Mexico	480	15	0	26,310	2,068	0
	Western North Atlantic	310,453	19,435	0	382,097	24,238	0
False killer whale	Northern Gulf of Mexico	202	6	0	8,985	632	0
	Western North Atlantic	36,930	2,108	0	47,201	2,746	0
Fraser's dolphin	Northern Gulf of Mexico	296	0	0	4,825	254	0
	Western North Atlantic	17,722	911	0	22,527	1,307	0
Killer whale	Northern Gulf of Mexico	4	0	0	394	22	0
	Western North Atlantic	356	16	0	426	21	0
Long-finned pilot whale	Western North Atlantic	79,018	3,999	0	98,254	5,114	0
Melon-headed whale	Northern Gulf of Mexico	342	10	0	28,375	2,063	0
	Western North Atlantic	165,918	9,376	0	210,222	12,113	0
Pantropical spotted dolphin	Northern Gulf of Mexico	2,745	79	0	273,629	20,760	0
	Western North Atlantic	647,721	38,972	0	819,049	50,868	0
Pygmy killer whale	Northern Gulf of Mexico	82	0	0	6,236	461	0
	Western North Atlantic	29,087	1,544	0	36,544	2,039	0
Risso's dolphin	Northern Gulf of Mexico	192	5	0	9,657	698	0
	Western North Atlantic	94,702	5,289	0	124,991	7,202	0
Rough-toothed dolphin	Northern Gulf of Mexico	418	16	0	12,087	1,011	0
	Western North Atlantic	86,203	6,080	0	110,536	8,052	0

**Table E.2-1: Estimated Marine Mammal Impacts per 5-Year Period from Sonar Training Activities (continued)**

<i>Species</i>	<i>Stock</i>	<i>Alternative 1 – 5-Year</i>			<i>Alternative 2 – 5-Year</i>		
		<i>Behavioral Response</i>	<i>TTS</i>	<i>PTS</i>	<i>Behavioral Response</i>	<i>TTS</i>	<i>PTS</i>
Short-beaked common dolphin	Western North Atlantic	966,841	78,755	0	1,267,132	107,218	0
Short-finned pilot whale	Northern Gulf of Mexico	175	4	0	6,464	356	0
	Western North Atlantic	143,040	7,138	0	180,010	8,913	0
Spinner dolphin	Northern Gulf of Mexico	1,103	33	0	133,750	10,609	0
	Western North Atlantic	326,368	20,886	0	413,886	27,409	0
Striped dolphin	Northern Gulf of Mexico	326	10	0	24,859	1,948	0
	Western North Atlantic	425,279	25,620	0	514,348	32,134	0
White-beaked dolphin	Western North Atlantic	184	8	0	185	8	0
<b><i>Family Phocoenidae (porpoises)</i></b>							
Harbor porpoise	Gulf of Maine/Bay of Fundy	108,959	35,338	58	125,761	41,817	68
<b><i>Suborder Pinnipedia</i></b>							
<b><i>Family Phocidae (true seals)</i></b>							
Gray seal	Western North Atlantic	2,142	5,030	0	2,143	5,050	0
Harbor seal	Western North Atlantic	3,473	8,158	0	3,475	8,190	0
Harp seal	Western North Atlantic	13,431	28,757	4	13,431	28,760	4
Hooded seal	Western North Atlantic	204	427	0	207	447	0
<b><i>Order Sirenia</i></b>							
<b><i>Family Trichechidae (manatees)</i></b>							
West Indian manatee*	Florida, Antillean	0	0	0	0	0	0

\* ESA-listed species (all stocks) within the AFTT Study Area

†NSD: No stock designation

PTS: permanent threshold shift; TTS: temporary threshold shift

### **E.3 ESTIMATED MARINE MAMMAL IMPACTS FROM SONAR AND OTHER TRANSDUCERS UNDER NAVY TESTING ACTIVITIES**

Table E.3-1 provides a summary of the estimated number of marine mammal impacts from exposure to sonar and other transducers used during Navy testing activities under Alternatives 1 and 2 over the course of a year.

**Table E.3-1: Estimated Marine Mammal Impacts per Year from Sonar Testing Activities**

Species	Stock	Alternative 1 – Minimum			Alternative 1 – Maximum			Alternative 2		
		Behavioral Response	TTS	PTS	Behavioral Response	TTS	PTS	Behavioral Response	TTS	PTS
Suborder Mysticeti (baleen whales)										
Family Balaenidae (right whales)										
North Atlantic right whale*	Western North Atlantic	79	126	0	87	127	0	87	127	0
Family Balaenopteridae (roquals)										
Blue whale*	Western North Atlantic (Gulf of St. Lawrence)	3	16	0	4	16	0	4	16	0
Bryde's whale	Northern Gulf of Mexico	23	27	0	24	27	0	24	27	0
	NSD <sup>†</sup>	21	99	0	24	100	0	24	100	0
Minke whale	Canadian East Coast	284	1,285	1	314	1,289	1	315	1,290	1
Fin whale*	Western North Atlantic	1,034	2,406	2	1,183	2,434	2	1,189	2,435	2
Humpback whale	Gulf of Maine	165	300	0	180	302	0	181	302	0
Sei whale*	Nova Scotia	136	316	0	157	320	0	157	320	0
Suborder Odontoceti (toothed whales)										
Family Physeteridae (sperm whale)										
Sperm whale*	Gulf of Mexico Oceanic	993	23	0	1,083	23	0	1,076	23	0
	North Atlantic	9,431	325	0	10,946	327	0	10,968	327	0
Family Kogiidae (sperm whales)										
Dwarf sperm whale	Gulf of Mexico Oceanic	292	362	1	331	382	1	326	380	1
	Western North Atlantic	931	3,202	7	1,081	3,260	7	1,074	3,254	7

**Table E.3-1: Estimated Marine Mammal Impacts per Year from Sonar Testing Activities (continued)**

Species	Stock	Alternative 1 – Minimum			Alternative 1 – Maximum			Alternative 2		
		Behavioral Response	TTS	PTS	Behavioral Response	TTS	PTS	Behavioral Response	TTS	PTS
Pygmy sperm whale	Northern Gulf of Mexico	292	362	1	331	382	1	326	380	1
	Western North Atlantic	931	3,202	7	1,081	3,260	7	1,074	3,254	7
<b>Family Ziphiidae (beaked whales)</b>										
Blainville's beaked whale	Northern Gulf of Mexico	1,305	7	0	1,385	7	0	1,383	7	0
	Western North Atlantic	9,435	92	0	10,471	92	0	10,520	92	0
Cuvier's beaked whale	Northern Gulf of Mexico	1,357	7	0	1,453	7	0	1,447	7	0
	Western North Atlantic	34,634	340	0	38,433	341	0	38,614	341	0
Gervais' beaked whale	Northern Gulf of Mexico	1,305	7	0	1,385	7	0	1,383	7	0
	Western North Atlantic	9,435	92	0	10,471	92	0	10,520	92	0
Northern bottlenose whale	Western North Atlantic	853	3	0	968	3	0	976	3	0
Sowerby's beaked whale	Western North Atlantic	9,457	92	0	10,499	92	0	10,547	92	0
True's beaked whale	Western North Atlantic	9,457	92	0	10,499	92	0	10,547	92	0
<b>Family Delphinidae (dolphins)</b>										
Atlantic spotted dolphin	Northern Gulf of Mexico	67,680	3,554	0	68,265	3,563	0	68,257	3,563	0
	Western North Atlantic	84,352	11,489	0	97,925	11,516	0	96,533	11,514	0
Atlantic white-sided dolphin	Western North Atlantic	27,602	1,274	0	30,468	1,284	0	30,597	1,284	0

**Table E.3-1: Estimated Marine Mammal Impacts per Year from Sonar Testing Activities (continued)**

<i>Species</i>	<i>Stock</i>	<i>Alternative 1 – Minimum</i>			<i>Alternative 1 – Maximum</i>			<i>Alternative 2</i>		
		<i>Behavioral Response</i>	<i>TTS</i>	<i>PTS</i>	<i>Behavioral Response</i>	<i>TTS</i>	<i>PTS</i>	<i>Behavioral Response</i>	<i>TTS</i>	<i>PTS</i>
Bottlenose dolphin	Choctawatchee Bay	932	31	0	933	31	0	933	31	0
	Gulf of Mexico Eastern Coastal	0	0	0	0	0	0	0	0	0
	Gulf of Mexico Northern Coastal	15,297	812	0	15,418	813	0	15,418	813	0
	Gulf of Mexico Western Coastal	3,459	100	0	3,571	102	0	3,571	102	0
	Indian River Lagoon Estuarine System	0	3	0	0	3	0	0	3	0
	Jacksonville Estuarine System	0	3	0	0	3	0	0	3	0
	Mississippi Sound, Lake Borgne, Bay Boudreau	1	0	0	1	0	0	1	0	0
	Northern Gulf of Mexico Continental Shelf	118,763	6,125	0	119,608	6,135	0	119,608	6,135	0
	Northern Gulf of Mexico Oceanic	13,383	672	0	13,749	674	0	13,674	674	0
	Northern North Carolina Estuarine System	80	26	0	80	26	0	80	26	0
	Southern North Carolina Estuarine System	0	0	0	0	0	0	0	0	0
	Western North Atlantic Northern Florida Coastal	273	46	0	282	47	0	285	47	0

**Table E.3-1: Estimated Marine Mammal Impacts per Year from Sonar Testing Activities (continued)**

<i>Species</i>	<i>Stock</i>	<i>Alternative 1 – Minimum</i>			<i>Alternative 1 – Maximum</i>			<i>Alternative 2</i>		
		<i>Behavioral Response</i>	<i>TTS</i>	<i>PTS</i>	<i>Behavioral Response</i>	<i>TTS</i>	<i>PTS</i>	<i>Behavioral Response</i>	<i>TTS</i>	<i>PTS</i>
	Western North Atlantic Central Florida Coastal	1,999	229	0	2,041	229	0	2,055	229	0
	Western North Atlantic Northern Migratory Coastal	9,768	1,107	1	10,725	1,108	1	10,754	1,108	1
	Western North Atlantic Offshore	99,614	11,276	5	108,400	11,289	5	107,629	11,288	5
	Western North Atlantic South Carolina/ Georgia Coastal	1,366	221	0	1,409	221	0	1,423	221	0
	Western North Atlantic Southern Migratory Coastal	3,524	609	0	3,607	610	0	3,639	610	0
Clymene dolphin	Northern Gulf of Mexico	3,798	85	0	4,077	87	0	4,058	86	0
	Western North Atlantic	29,628	3,533	0	32,412	3,539	0	32,121	3,539	0
False killer whale	Northern Gulf of Mexico	1,764	69	0	1,862	69	0	1,855	69	0
	Western North Atlantic	3,085	394	0	3,368	395	0	3,323	395	0
Fraser's dolphin	Northern Gulf of Mexico	1,012	55	0	1,064	56	0	1,060	56	0
	Western North Atlantic	1,092	96	0	1,196	96	0	1,189	96	0
Killer whale	Northern Gulf of Mexico	29	0	0	32	0	0	32	0	0



**Table E.3-1: Estimated Marine Mammal Impacts per Year from Sonar Testing Activities (continued)**

<i>Species</i>	<i>Stock</i>	<i>Alternative 1 – Minimum</i>			<i>Alternative 1 – Maximum</i>			<i>Alternative 2</i>		
		<i>Behavioral Response</i>	<i>TTS</i>	<i>PTS</i>	<i>Behavioral Response</i>	<i>TTS</i>	<i>PTS</i>	<i>Behavioral Response</i>	<i>TTS</i>	<i>PTS</i>
	Western North Atlantic	33	3	0	39	3	0	38	3	0
Long-finned pilot whale	Western North Atlantic	17,178	793	0	19,696	797	0	19,779	797	0
Melon-headed whale	Northern Gulf of Mexico	2,770	57	0	2,999	59	0	2,984	59	0
	Western North Atlantic	13,696	1,725	0	14,946	1,729	0	14,763	1,729	0
Pantropical spotted dolphin	Northern Gulf of Mexico	23,040	538	0	25,371	549	0	25,046	548	0
	Western North Atlantic	61,398	6,861	0	70,526	6,883	0	69,896	6,876	0
Pygmy killer whale	Northern Gulf of Mexico	650	15	0	704	15	0	700	15	0
	Western North Atlantic	2,327	288	0	2,557	288	0	2,527	288	0
Risso's dolphin	Northern Gulf of Mexico	1,491	40	0	1,609	40	0	1,600	40	0
	Western North Atlantic	17,309	1,053	0	19,004	1,057	0	18,987	1,057	0
Rough-toothed dolphin	Northern Gulf of Mexico	3,610	166	0	3,755	167	0	3,744	167	0
	Western North Atlantic	7,021	1,145	0	7,612	1,146	0	7,526	1,146	0
Short-beaked common dolphin	Western North Atlantic	311,228	12,932	0	339,800	12,986	0	341,100	12,991	0
Short-finned pilot whale	Northern Gulf of Mexico	1,652	21	0	1,800	22	0	1,785	22	0
	Western North Atlantic	14,564	1,096	0	15,896	1,099	0	15,872	1,099	0

**Table E.3-1: Estimated Marine Mammal Impacts per Year from Sonar Testing Activities (continued)**

Species	Stock	Alternative 1 – Minimum			Alternative 1 – Maximum			Alternative 2		
		Behavioral Response	TTS	PTS	Behavioral Response	TTS	PTS	Behavioral Response	TTS	PTS
Spinner dolphin	Northern Gulf of Mexico	6,834	226	0	7,581	230	0	7,525	230	0
	Western North Atlantic	26,997	3,795	0	29,517	3,801	0	29,104	3,800	0
Striped dolphin	Northern Gulf of Mexico	2,219	61	0	2,384	63	0	2,378	62	0
	Western North Atlantic	80,813	6,676	0	95,297	6,703	0	95,763	6,702	0
White-beaked dolphin	Western North Atlantic	40	2	0	42	2	0	42	2	0
<b>Family Phocoenidae (porpoises)</b>										
Harbor porpoise	Gulf of Maine/Bay of Fundy	96,211	12,102	23	110,744	13,433	25	111,627	13,433	25
<b>Suborder Pinnipedia</b>										
<b>Family Phocidae (true seals)</b>										
Gray seal	Western North Atlantic	338	514	2	366	516	2	366	516	2
Harbor seal	Western North Atlantic	548	834	3	593	836	3	594	836	3
Harp seal	Western North Atlantic	3,290	4,170	0	3,613	4,173	0	3,626	4,174	0
Hooded seal	Western North Atlantic	364	376	0	403	379	0	407	379	0
<b>Order Sirenia</b>										
<b>Family Trichechidae (manatees)</b>										
West Indian manatee*	Florida, Antillean	0	0	0	0	0	0	0	0	0

\* ESA-listed species (all stocks) within the AFTT Study Area

†NSD: No stock designated

PTS: permanent threshold shift; TTS: temporary threshold shift

## E.4 ESTIMATED MARINE MAMMAL IMPACTS PER FIVE YEAR PERIOD FROM SONAR AND OTHER TRANSDUCERS UNDER NAVY TESTING ACTIVITIES

Table E.4-1 provides a summary of the estimated number of marine mammal impacts from exposure to sonar and other transducers used during Navy testing activities under Alternatives 1 and 2 over the course of five years.

**Table E.4-1: Estimated Marine Mammal Impacts per 5-Year Period from Sonar Testing Activities**

Species	Stock	Alternative 1 – 5-Year			Alternative 2 – 5-Year		
		Behavioral Response	TTS	PTS	Behavioral Response	TTS	PTS
Suborder Mysticeti (baleen whales)							
Family Balaenidae (right whales)							
North Atlantic right whale*	Western North Atlantic	410	633	0	436	636	0
Family Balaenopteridae (roquals)							
Blue whale*	Western North Atlantic (Gulf of St. Lawrence)	17	78	0	19	78	0
Bryde's whale	Northern Gulf of Mexico	118	136	0	121	136	0
	NSD <sup>†</sup>	110	498	0	119	499	0
Minke whale	Canadian East Coast	1,475	6,433	3	1,575	6,451	3
Fin whale*	Western North Atlantic	5,453	12,086	9	5,935	12,175	9
Humpback whale	Gulf of Maine	853	1,505	0	904	1,511	0
Sei whale*	Nova Scotia	718	1,587	0	785	1,600	0
Suborder Odontoceti (toothed whales)							
Family Physeteridae (sperm whale)							
Sperm whale*	Gulf of Mexico Oceanic	5,124	114	0	5,389	114	0
	North Atlantic	50,008	1,628	0	54,799	1,633	0
Family Kogiidae (sperm whales)							
Dwarf sperm whale	Gulf of Mexico Oceanic	1,511	1,843	5	1,624	1,901	5
	Western North Atlantic	4,875	16,087	34	5,373	16,253	34
Pygmy sperm whale	Northern Gulf of Mexico	1,511	1,843	5	1,624	1,901	5
	Western North Atlantic	4,875	16,087	34	5,373	16,253	34

**Table E.4-1: Estimated Marine Mammal Impacts per 5-Year Period from Sonar Testing Activities (continued)**

Species	Stock	Alternative 1 – 5-Year			Alternative 2 – 5-Year		
		Behavioral Response	TTS	PTS	Behavioral Response	TTS	PTS
Family Ziphiidae (beaked whales)							
Blainville's beaked whale	Northern Gulf of Mexico	6,677	33	0	6,918	33	0
	Western North Atlantic	49,178	461	0	52,574	462	0
Cuvier's beaked whale	Northern Gulf of Mexico	6,955	33	0	7,241	33	0
	Western North Atlantic	180,501	1,700	0	192,959	1,703	0
Gervais' beaked whale	Northern Gulf of Mexico	6,677	33	0	6,918	33	0
	Western North Atlantic	49,178	461	0	52,574	462	0
Northern bottlenose whale	Western North Atlantic	4,471	14	0	4,854	14	0
Sowerby's beaked whale	Western North Atlantic	49,295	461	0	52,709	462	0
True's beaked whale	Western North Atlantic	49,295	461	0	52,709	462	0
Family Delphinidae (dolphins)							
Atlantic spotted dolphin	Northern Gulf of Mexico	315,739	17,787	0	317,623	17,816	0
	Western North Atlantic	446,418	57,490	0	484,209	57,564	0
Atlantic white-sided dolphin	Western North Atlantic	143,547	6,388	0	152,840	6,419	0
Bottlenose dolphin	Choctawatchee Bay	4,255	155	0	4,259	155	0
	Gulf of Mexico Eastern Coastal	0	0	0	0	0	0
	Gulf of Mexico Northern Coastal	72,240	4,063	0	72,622	4,067	0
	Gulf of Mexico Western Coastal	17,509	504	0	17,853	509	0

**Table E.4-1: Estimated Marine Mammal Impacts per 5-Year Period from Sonar Testing Activities (continued)**

<i>Species</i>	<i>Stock</i>	<i>Alternative 1 – 5-Year</i>			<i>Alternative 2 – 5-Year</i>		
		<i>Behavioral Response</i>	<i>TTS</i>	<i>PTS</i>	<i>Behavioral Response</i>	<i>TTS</i>	<i>PTS</i>
	Indian River Lagoon Estuarine System	0	14	0	0	14	0
	Jacksonville Estuarine System	0	13	0	0	13	0
	Mississippi Sound, Lake Borgne, Bay Boudreau	3	0	0	3	0	0
	Northern Gulf of Mexico Continental Shelf	563,290	30,645	0	565,966	30,675	0
	Northern Gulf of Mexico Oceanic	63,756	3,364	0	64,791	3,368	0
	Northern North Carolina Estuarine System	402	131	0	402	131	0
	Southern North Carolina Estuarine System	0	0	0	0	0	0
	Western North Atlantic Northern Florida Coastal	1,380	232	0	1,420	233	0
	Western North Atlantic Central Florida Coastal	9,794	1,144	0	9,995	1,145	0
	Western North Atlantic Northern Migratory Coastal	50,680	5,537	3	53,746	5,540	3
	Western North Atlantic Offshore	509,264	56,396	27	534,968	56,431	27

**Table E.4-1: Estimated Marine Mammal Impacts per 5-Year Period from Sonar Testing Activities (continued)**

<i>Species</i>	<i>Stock</i>	<i>Alternative 1 – 5-Year</i>			<i>Alternative 2 – 5-Year</i>		
		<i>Behavioral Response</i>	<i>TTS</i>	<i>PTS</i>	<i>Behavioral Response</i>	<i>TTS</i>	<i>PTS</i>
	Western North Atlantic South Carolina/ Georgia Coastal	6,901	1,104	0	7,101	1,105	0
	Western North Atlantic Southern Migratory Coastal	17,758	3,047	0	18,171	3,049	0
Clymene dolphin	Northern Gulf of Mexico	19,485	427	0	20,308	432	0
	Western North Atlantic	152,208	17,672	0	160,211	17,691	0
False killer whale	Northern Gulf of Mexico	8,771	345	0	9,060	347	0
	Western North Atlantic	15,731	1,970	0	16,530	1,973	0
Fraser's dolphin	Northern Gulf of Mexico	5,037	277	0	5,193	278	0
	Western North Atlantic	5,586	480	0	5,913	481	0
Killer whale	Northern Gulf of Mexico	150	0	0	158	0	0
	Western North Atlantic	173	15	0	189	15	0
Long-finned pilot whale	Western North Atlantic	90,679	3,972	0	98,724	3,985	0
Melon-headed whale	Northern Gulf of Mexico	14,252	289	0	14,931	293	0
	Western North Atlantic	69,856	8,632	0	73,369	8,642	0
Pantropical spotted dolphin	Northern Gulf of Mexico	118,718	2,709	0	125,371	2,739	0
	Western North Atlantic	321,363	34,335	0	349,592	34,380	0
Pygmy killer whale	Northern Gulf of Mexico	3,342	73	0	3,501	74	0
	Western North Atlantic	11,977	1,440	0	12,638	1,441	0
Risso's dolphin	Northern Gulf of Mexico	7,618	200	0	7,964	202	0

**Table E.4-1: Estimated Marine Mammal Impacts per 5-Year Period from Sonar Testing Activities (continued)**

<i>Species</i>	<i>Stock</i>	<i>Alternative 1 – 5-Year</i>			<i>Alternative 2 – 5-Year</i>		
		<i>Behavioral Response</i>	<i>TTS</i>	<i>PTS</i>	<i>Behavioral Response</i>	<i>TTS</i>	<i>PTS</i>
	Western North Atlantic	88,695	5,273	0	93,963	5,285	0
Rough-toothed dolphin	Northern Gulf of Mexico	17,637	831	0	18,069	835	0
	Western North Atlantic	35,731	5,727	0	37,424	5,730	0
Short-beaked common dolphin	Western North Atlantic	1,610,106	64,753	0	1,703,401	64,934	0
Short-finned pilot whale	Northern Gulf of Mexico	8,503	106	0	8,934	108	0
	Western North Atlantic	75,058	5,486	0	79,228	5,495	0
Spinner dolphin	Northern Gulf of Mexico	35,410	1,138	0	37,614	1,150	0
	Western North Atlantic	138,115	18,981	0	145,211	18,998	0
Striped dolphin	Northern Gulf of Mexico	11,391	309	0	11,888	312	0
	Western North Atlantic	431,756	33,425	0	478,001	33,502	0
White-beaked dolphin	Western North Atlantic	202	11	0	210	12	0
<b><i>Family Phocoenidae (porpoises)</i></b>							
Harbor porpoise	Gulf of Maine/Bay of Fundy	509,229	63,072	120	557,596	67,085	125
<b><i>Suborder Pinnipedia</i></b>							
<b><i>Family Phocidae (true seals)</i></b>							
Gray seal	Western North Atlantic	1,744	2,575	9	1,831	2,579	9
Harbor seal	Western North Atlantic	2,827	4,175	14	2,969	4,182	14
Harp seal	Western North Atlantic	17,095	20,858	0	18,128	20,868	0
Hooded seal	Western North Atlantic	1,896	1,885	0	2,033	1,893	0
<b><i>Order Sirenia</i></b>							
<b><i>Family Trichechidae (manatees)</i></b>							

**Table E.4-1: Estimated Marine Mammal Impacts per 5-Year Period from Sonar Testing Activities (continued)**

<i>Species</i>	<i>Stock</i>	<i>Alternative 1 – 5-Year</i>			<i>Alternative 2 – 5-Year</i>		
		<i>Behavioral Response</i>	<i>TTS</i>	<i>PTS</i>	<i>Behavioral Response</i>	<i>TTS</i>	<i>PTS</i>
West Indian manatee*	Florida, Antillean	0	0	0	0	0	0

\* ESA-listed species (all stocks) within the AFTT Study Area

†NSD: No stock designated

PTS: permanent threshold shift; TTS: temporary threshold shift

## **E.5 ESTIMATED MARINE MAMMAL IMPACTS FROM AIR GUNS UNDER NAVY TRAINING ACTIVITIES**

There are no air gun activities under training, therefore there are no anticipated takes.

## **E.6 ESTIMATED MARINE MAMMAL IMPACTS FROM AIR GUNS UNDER NAVY TESTING ACTIVITIES**

Table E.6-1 provides a summary of the estimated number of marine mammal impacts from exposure to air guns used during Navy testing activities under Alternatives 1 and 2 over the course of a year. Most species and stocks in the Study Area either do not occur in areas where air gun activities take place, or did not result in any estimated impact based on the quantitative analysis.



**Table E.6-1: Estimated Marine Mammal Impacts per Year from Air Gun Testing Activities**

Species	Stock	Alternative 1 – Minimum				Alternative 1 – Maximum				Alternative 2			
		Behavioral Response	TTS	PTS	Injury	Behavioral Response	TTS	PTS	Injury	Behavioral Response	TTS	PTS	Injury
Family Delphinidae (dolphins)													
Bottlenose dolphin	Western North Atlantic Offshore	1	0	0	0	1	0	0	0	1	0	0	0
Clymene dolphin	Western North Atlantic	1	0	0	0	1	0	0	0	1	0	0	0
Suborder Pinnipedia													
Family Phocidae (true seals)													
Gray seal	Western North Atlantic	1	0	0	0	1	0	0	0	1	0	0	0
Harbor seal	Western North Atlantic	2	0	0	0	2	0	0	0	2	0	0	0

PTS: permanent threshold shift; TTS: temporary threshold shift

## E.7 ESTIMATED MARINE MAMMAL IMPACTS PER FIVE YEAR PERIOD FROM AIR GUNS UNDER NAVY TESTING ACTIVITIES

Table E.7-1 provides a summary of the estimated number of marine mammal impacts from exposure to air guns used during Navy testing activities under Alternatives 1 and 2 over the course of five years. Most species or stock in the Study Area either do not occur in areas where air gun activities take place, or did not result in any estimated impact based on quantitative analysis.

**Table E.7-1: Estimated Marine Mammal Impacts per 5-Year Period from Air Gun Testing Activities**

Species	Stock	Alternative 1 – 5-Year				Alternative 2 – 5-Year			
		Behavioral Response	TTS	PTS	Injury	Behavioral Response	TTS	PTS	Injury
Bottlenose dolphin	Western North Atlantic Offshore	6	0	0	0	6	0	0	0
Clymene dolphin	Western North Atlantic	3	0	0	0	3	0	0	0
<i>Suborder Pinnipedia</i>									
<i>Family Phocidae (true seals)</i>									
Gray seal	Western North Atlantic	6	0	0	0	6	0	0	0
Harbor seal	Western North Atlantic	9	0	0	0	9	0	0	0

PTS: permanent threshold shift; TTS: temporary threshold shift

## E.8 ESTIMATED MARINE MAMMAL IMPACTS FROM PILE DRIVING UNDER NAVY TRAINING ACTIVITIES

Table E.8-1 provides a summary of the estimated number of marine mammal impacts from exposure to pile driving used during Navy training activities under Alternatives 1 and 2 over the course of a year. Pile driving only occurs in the Atlantic regions of the Study Area, therefore species or stocks that occur in the Gulf of Mexico would not be impacted. Most species or stocks in the Study Area either do not occur in areas where pile driving activities take place, or did not result in any estimated impact based on quantitative analysis.

**Table E.8-1: Estimated Marine Mammal Impacts per Year from Pile Driving Training Activities**

Species	Stock	Alternative 1 – Minimum			Alternative 1 – Maximum			Alternative 2		
		Behavioral Response	TTS	PTS	Behavioral Response	TTS	PTS	Behavioral Response	TTS	PTS
Family Delphinidae (dolphins)										
Atlantic spotted dolphin	Western North Atlantic	16	0	0	16	0	0	16	0	0
Bottlenose dolphin	Northern North Carolina Estuarine System	1	0	0	1	0	0	1	0	0
	Western North Atlantic Northern Migratory Coastal	14	0	0	14	0	0	14	0	0
	Western North Atlantic Southern Migratory Coastal	87	0	0	87	0	0	87	0	0
	Western North Atlantic Offshore	791	0	0	791	0	0	791	0	0

PTS: permanent threshold shift; TTS: temporary threshold shift

## E.9 ESTIMATED MARINE MAMMAL IMPACTS PER FIVE YEAR PERIOD FROM PILE DRIVING UNDER NAVY TRAINING ACTIVITIES

Table E.9-1 provides a summary of the estimated number of marine mammal impacts from exposure to pile driving used during Navy training activities under Alternatives 1 and 2 over the course of five years. Pile driving only occurs in the Atlantic regions of the Study Area, therefore species or stocks that occur in the Gulf of Mexico would not be impacted. Most species or stocks in the Study Area either do not occur in areas where pile driving activities take place, or did not result in any estimated impact based on quantitative analysis.

**Table E.9-1: Estimated Marine Mammal Impacts per 5-Year Period from Pile Driving Training Activities**

Species	Stock	Alternative 1 – 5-Year			Alternative 2 – 5-Year		
		Behavioral Response	TTS	PTS	Behavioral Response	TTS	PTS
Family Delphinidae (dolphins)							
Atlantic spotted dolphin	Western North Atlantic	79	0	0	79	0	0
Bottlenose dolphin	Northern North Carolina Estuarine System	5	0	0	5	0	0
	Western North Atlantic Northern Migratory Coastal	68	0	0	68	0	0
	Western North Atlantic Southern Migratory Coastal	433	0	0	433	0	0
	Western North Atlantic Offshore	3,954	0	0	3,954	0	0

PTS: permanent threshold shift; TTS: temporary threshold shift

## E.10 ESTIMATED MARINE MAMMAL IMPACTS FROM PILE DRIVING UNDER NAVY TESTING ACTIVITIES

There are no pile driving activities under testing, therefore there are no anticipated takes.

## E.11 ESTIMATED MARINE MAMMAL IMPACTS FROM EXPLOSIVES UNDER NAVY TRAINING ACTIVITIES

Table E.11-1 provides a summary of the estimated number of marine mammal impacts from exposure to explosives used during Navy training activities under Alternatives 1 and 2 over the course of a year.

**Table E.11-1: Estimated Marine Mammal Impacts per year from Explosive Training Activities**

Species	Stock	Alternative 1 – Minimum				Alternative 1 – Maximum				Alternative 2			
		Behavioral Response	TTS	PTS	Injury	Behavioral Response	TTS	PTS	Injury	Behavioral Response	TTS	PTS	Injury
Suborder Mysticeti (baleen whales)													
Family Balaenidae (right whales)													
North Atlantic right whale*	Western North Atlantic	0	7	0	0	0	8	0	0	0	7	0	0
Family Balaenopteridae (roquals)													
Blue whale*	Western North Atlantic (Gulf of St. Lawrence)	0	0	0	0	0	0	0	0	0	0	0	0
Bryde's whale	Northern Gulf of Mexico	0	0	0	0	0	0	0	0	0	0	0	0
	NSD <sup>†</sup>	0	2	0	0	0	2	0	0	0	2	0	0
Minke whale	Canadian East Coast	0	13	0	0	0	13	0	0	0	13	0	0
Fin whale*	Western North Atlantic	0	32	3	0	0	32	3	0	0	32	3	0
Humpback whale	Gulf of Maine	0	14	1	0	0	14	1	0	0	14	1	0
Sei whale*	Nova Scotia	0	2	0	0	0	2	0	0	0	2	0	0

**Table E.11-1: Estimated Marine Mammal Impacts per year from Explosive Training Activities (continued)**

Species	Stock	Alternative 1 – Minimum				Alternative 1 – Maximum				Alternative 2			
		Behavioral Response	TTS	PTS	Injury	Behavioral Response	TTS	PTS	Injury	Behavioral Response	TTS	PTS	Injury
Suborder Odontoceti (toothed whales)													
Family Physeteridae (sperm whale)													
Sperm whale*	Gulf of Mexico Oceanic	0	0	0	0	0	0	0	0	0	0	0	0
	North Atlantic	2	3	0	0	2	3	0	0	2	3	0	0
Family Kogiidae (sperm whales)													
Dwarf sperm whale	Gulf of Mexico Oceanic	0	1	0	0	0	1	0	0	0	1	0	0
	Western North Atlantic	9	14	3	0	9	14	3	0	9	14	3	0
Pygmy sperm whale	Northern Gulf of Mexico	0	1	0	0	0	1	0	0	0	1	0	0
	Western North Atlantic	9	14	3	0	9	14	3	0	9	14	3	0
Family Ziphiidae (beaked whales)													
Blainville's beaked whale	Northern Gulf of Mexico	0	0	0	0	0	0	0	0	0	0	0	0
	Western North Atlantic	0	1	0	0	0	1	0	0	0	1	0	0

**Table E.11-1: Estimated Marine Mammal Impacts per year from Explosive Training Activities (continued)**

<i>Species</i>	<i>Stock</i>	<i>Alternative 1 – Minimum</i>				<i>Alternative 1 – Maximum</i>				<i>Alternative 2</i>			
		<i>Behavioral Response</i>	<i>TTS</i>	<i>PTS</i>	<i>Injury</i>	<i>Behavioral Response</i>	<i>TTS</i>	<i>PTS</i>	<i>Injury</i>	<i>Behavioral Response</i>	<i>TTS</i>	<i>PTS</i>	<i>Injury</i>
Cuvier's beaked whale	Northern Gulf of Mexico	0	0	0	0	0	0	0	0	0	0	0	0
	Western North Atlantic	2	3	0	0	2	3	0	0	2	3	0	0
Gervais' beaked whale	Northern Gulf of Mexico	0	0	0	0	0	0	0	0	0	0	0	0
	Western North Atlantic	0	1	0	0	0	1	0	0	0	1	0	0
Northern bottlenose whale	Western North Atlantic	0	0	0	0	0	0	0	0	0	0	0	0
Sowerby's beaked whale	Western North Atlantic	0	1	0	0	0	1	0	0	0	1	0	0
True's beaked whale	Western North Atlantic	0	1	0	0	0	1	0	0	0	1	0	0
<b><i>Family Delphinidae (dolphins)</i></b>													
Atlantic spotted dolphin	Northern Gulf of Mexico	1	5	0	0	1	5	0	0	1	5	0	0
	Western North Atlantic	33	78	8	1	33	78	8	1	33	78	8	1

**Table E.11-1: Estimated Marine Mammal Impacts per year from Explosive Training Activities (continued)**

<i>Species</i>	<i>Stock</i>	<i>Alternative 1 – Minimum</i>				<i>Alternative 1 – Maximum</i>				<i>Alternative 2</i>			
		<i>Behavioral Response</i>	<i>TTS</i>	<i>PTS</i>	<i>Injury</i>	<i>Behavioral Response</i>	<i>TTS</i>	<i>PTS</i>	<i>Injury</i>	<i>Behavioral Response</i>	<i>TTS</i>	<i>PTS</i>	<i>Injury</i>
Atlantic white-sided dolphin	Western North Atlantic	3	7	0	0	3	7	0	0	3	7	0	0
Bottlenose dolphin	Choctawatchee Bay	0	0	0	0	0	0	0	0	0	0	0	0
	Gulf of Mexico Eastern Coastal	0	0	0	0	0	0	0	0	0	0	0	0
	Gulf of Mexico Northern Coastal	1	3	0	0	1	3	0	0	1	3	0	0
	Gulf of Mexico Western Coastal	1	1	0	0	1	1	0	0	1	1	0	0
	Indian River Lagoon Estuarine System	0	0	0	0	0	0	0	0	0	0	0	0
	Jacksonville Estuarine System	0	0	0	0	0	0	0	0	0	0	0	0
	Mississippi Sound, Lake Borgne, Bay Boudreau	0	0	0	0	0	0	0	0	0	0	0	0



**Table E.11-1: Estimated Marine Mammal Impacts per year from Explosive Training Activities (continued)**

<i>Species</i>	<i>Stock</i>	<i>Alternative 1 – Minimum</i>				<i>Alternative 1 – Maximum</i>				<i>Alternative 2</i>			
		<i>Behavioral Response</i>	<i>TTS</i>	<i>PTS</i>	<i>Injury</i>	<i>Behavioral Response</i>	<i>TTS</i>	<i>PTS</i>	<i>Injury</i>	<i>Behavioral Response</i>	<i>TTS</i>	<i>PTS</i>	<i>Injury</i>
	Northern Gulf of Mexico Continental Shelf	4	21	2	0	4	22	2	0	4	21	2	0
	Northern Gulf of Mexico Oceanic	2	6	0	0	2	6	0	0	2	6	0	0
	Northern North Carolina Estuarine System	1	0	0	0	1	0	0	0	1	0	0	0
	Southern North Carolina Estuarine System	0	0	0	0	0	0	0	0	0	0	0	0
	Western North Atlantic Northern Florida Coastal	1	1	0	0	1	1	0	0	1	1	0	0
	Western North Atlantic Central Florida Coastal	3	5	0	0	3	5	0	0	3	5	0	0

**Table E.11-1: Estimated Marine Mammal Impacts per year from Explosive Training Activities (continued)**

<i>Species</i>	<i>Stock</i>	<i>Alternative 1 – Minimum</i>				<i>Alternative 1 – Maximum</i>				<i>Alternative 2</i>			
		<i>Behavioral Response</i>	<i>TTS</i>	<i>PTS</i>	<i>Injury</i>	<i>Behavioral Response</i>	<i>TTS</i>	<i>PTS</i>	<i>Injury</i>	<i>Behavioral Response</i>	<i>TTS</i>	<i>PTS</i>	<i>Injury</i>
	Western North Atlantic Northern Migratory Coastal	11	45	3	0	11	45	3	0	11	45	3	0
	Western North Atlantic Offshore	84	368	27	3	84	369	27	3	84	368	27	3
	Western North Atlantic South Carolina/Georgia Coastal	3	5	0	0	3	5	0	0	3	5	0	0
	Western North Atlantic Southern Migratory Coastal	10	18	1	0	10	18	1	0	10	18	1	0
Clymene dolphin	Northern Gulf of Mexico	0	0	0	0	0	0	0	0	0	0	0	0
	Western North Atlantic	8	20	3	0	8	20	3	0	8	20	3	0

**Table E.11-1: Estimated Marine Mammal Impacts per year from Explosive Training Activities (continued)**

<i>Species</i>	<i>Stock</i>	<i>Alternative 1 – Minimum</i>				<i>Alternative 1 – Maximum</i>				<i>Alternative 2</i>			
		<i>Behavioral Response</i>	<i>TTS</i>	<i>PTS</i>	<i>Injury</i>	<i>Behavioral Response</i>	<i>TTS</i>	<i>PTS</i>	<i>Injury</i>	<i>Behavioral Response</i>	<i>TTS</i>	<i>PTS</i>	<i>Injury</i>
False killer whale	Northern Gulf of Mexico	0	0	0	0	0	0	0	0	0	0	0	0
	Western North Atlantic	1	2	0	0	1	2	0	0	1	2	0	0
Fraser's dolphin	Northern Gulf of Mexico	0	0	0	0	0	0	0	0	0	0	0	0
	Western North Atlantic	0	0	0	0	0	0	0	0	0	0	0	0
Killer whale	Northern Gulf of Mexico	0	0	0	0	0	0	0	0	0	0	0	0
	Western North Atlantic	0	0	0	0	0	0	0	0	0	0	0	0
Long-finned pilot whale	Western North Atlantic	2	4	0	0	2	4	0	0	2	4	0	0
Melon-headed whale	Northern Gulf of Mexico	0	0	0	0	0	0	0	0	0	0	0	0
	Western North Atlantic	3	12	1	0	3	12	1	0	3	12	1	0
Pantropical spotted dolphin	Northern Gulf of Mexico	0	1	0	0	0	1	0	0	0	1	0	0

**Table E.11-1: Estimated Marine Mammal Impacts per year from Explosive Training Activities (continued)**

<i>Species</i>	<i>Stock</i>	<i>Alternative 1 – Minimum</i>				<i>Alternative 1 – Maximum</i>				<i>Alternative 2</i>			
		<i>Behavioral Response</i>	<i>TTS</i>	<i>PTS</i>	<i>Injury</i>	<i>Behavioral Response</i>	<i>TTS</i>	<i>PTS</i>	<i>Injury</i>	<i>Behavioral Response</i>	<i>TTS</i>	<i>PTS</i>	<i>Injury</i>
	Western North Atlantic	5	11	2	0	5	11	2	0	5	11	2	0
Pygmy killer whale	Northern Gulf of Mexico	0	0	0	0	0	0	0	0	0	0	0	0
	Western North Atlantic	1	1	0	0	1	1	0	0	1	1	0	0
Risso's dolphin	Northern Gulf of Mexico	0	0	0	0	0	0	0	0	0	0	0	0
	Western North Atlantic	2	4	0	0	2	4	0	0	2	4	0	0
Rough-toothed dolphin	Northern Gulf of Mexico	0	0	0	0	0	0	0	0	0	0	0	0
	Western North Atlantic	2	5	0	0	2	5	0	0	2	5	0	0
Short-beaked common dolphin	Western North Atlantic	40	79	12	1	40	79	12	1	40	79	12	1
Short-finned pilot whale	Northern Gulf of Mexico	0	0	0	0	0	0	0	0	0	0	0	0
	Western North Atlantic	2	5	0	0	2	5	0	0	2	5	0	0

**Table E.11-1: Estimated Marine Mammal Impacts per year from Explosive Training Activities (continued)**

Species	Stock	Alternative 1 – Minimum				Alternative 1 – Maximum				Alternative 2			
		Behavioral Response	TTS	PTS	Injury	Behavioral Response	TTS	PTS	Injury	Behavioral Response	TTS	PTS	Injury
Spinner dolphin	Northern Gulf of Mexico	0	0	0	0	0	0	0	0	0	0	0	0
	Western North Atlantic	4	14	1	0	4	14	1	0	4	14	1	0
Striped dolphin	Northern Gulf of Mexico	0	0	0	0	0	0	0	0	0	0	0	0
	Western North Atlantic	7	13	3	0	7	13	3	0	7	13	3	0
White-beaked dolphin	Western North Atlantic	0	0	0	0	0	0	0	0	0	0	0	0
<b>Family Phocoenidae (porpoises)</b>													
Harbor porpoise	Gulf of Maine/Bay of Fundy	106	493	149	0	106	493	149	0	106	493	149	0
<b>Suborder Pinnipedia</b>													
<b>Family Phocidae (true seals)</b>													
Gray seal	Western North Atlantic	0	0	0	0	0	0	0	0	0	0	0	0
Harbor seal	Western North Atlantic	0	0	0	0	0	0	0	0	0	0	0	0
Harp seal	Western North Atlantic	0	0	0	0	0	0	0	0	0	0	0	0

**Table E.11-1: Estimated Marine Mammal Impacts per year from Explosive Training Activities (continued)**

<i>Species</i>	<i>Stock</i>	<i>Alternative 1 – Minimum</i>				<i>Alternative 1 – Maximum</i>				<i>Alternative 2</i>			
		<i>Behavioral Response</i>	<i>TTS</i>	<i>PTS</i>	<i>Injury</i>	<i>Behavioral Response</i>	<i>TTS</i>	<i>PTS</i>	<i>Injury</i>	<i>Behavioral Response</i>	<i>TTS</i>	<i>PTS</i>	<i>Injury</i>
Hooded seal	Western North Atlantic	0	0	0	0	0	0	0	0	0	0	0	0
<b><i>Order Sirenia</i></b>													
<b><i>Family Trichechidae (manatees)</i></b>													
West Indian manatee*	Florida, Antillean	0	0	0	0	0	0	0	0	0	0	0	0

\* ESA-listed species (all stocks) within the AFTT Study Area

†NSD: No stock designated

PTS: permanent threshold shift; TTS: temporary threshold shift

## **E.12 ESTIMATED MARINE MAMMAL IMPACTS PER FIVE YEAR PERIOD FROM EXPLOSIVES UNDER NAVY TRAINING ACTIVITIES**

Table E.12-1 provides a summary of the estimated number of marine mammal impacts from exposure to explosives used during Navy training activities under Alternatives 1 and 2 over the course of five years.

**Table E.12-1: Estimated Marine Mammal Impacts per 5-Year Period from Explosive Training Activities**

Species	Stock	Alternative 1 – 5-Year				Alternative 2 – 5-Year			
		Behavioral Response	TTS	PTS	Injury	Behavioral Response	TTS	PTS	Injury
Suborder Mysticeti (baleen whales)									
Family Balaenidae (right whales)									
North Atlantic right whale*	Western North Atlantic	0	38	0	0	0	38	0	0
Family Balaenopteridae (roquals)									
Blue whale*	Western North Atlantic (Gulf of St. Lawrence)	0	0	0	0	0	0	0	0
Bryde's whale	Northern Gulf of Mexico	0	0	0	0	0	0	0	0
	NSD <sup>†</sup>	0	9	0	0	0	9	0	0
Minke whale	Canadian East Coast	0	66	0	0	0	66	0	0
Fin whale*	Western North Atlantic	0	159	13	0	0	159	13	0
Humpback whale	Gulf of Maine	0	69	3	0	0	69	3	0
Sei whale*	Nova Scotia	0	11	0	0	0	11	0	0
Suborder Odontoceti (toothed whales)									
Family Physeteridae (sperm whale)									
Sperm whale*	Gulf of Mexico Oceanic	0	0	0	0	0	0	0	0
	North Atlantic	10	15	0	0	10	15	0	0



**Table E.12-1: Estimated Marine Mammal Impacts per 5-Year Period from Explosive Training Activities (continued)**

Species	Stock	Alternative 1 – 5-Year				Alternative 2 – 5-Year			
		Behavioral Response	TTS	PTS	Injury	Behavioral Response	TTS	PTS	Injury
Family Kogiidae (sperm whales)									
Dwarf sperm whale	Gulf of Mexico Oceanic	0	4	0	0	0	4	0	0
	Western North Atlantic	47	70	15	0	47	70	15	0
Pygmy sperm whale	Northern Gulf of Mexico	0	4	0	0	0	4	0	0
	Western North Atlantic	47	70	15	0	47	70	15	0
Family Ziphiidae (beaked whales)									
Blainville's beaked whale	Northern Gulf of Mexico	0	0	0	0	0	0	0	0
	Western North Atlantic	0	3	0	0	0	3	0	0
Cuvier's beaked whale	Northern Gulf of Mexico	0	0	0	0	0	0	0	0
	Western North Atlantic	8	13	0	0	8	13	0	0
Gervais' beaked whale	Northern Gulf of Mexico	0	0	0	0	0	0	0	0
	Western North Atlantic	0	3	0	0	0	3	0	0
Northern bottlenose whale	Western North Atlantic	0	0	0	0	0	0	0	0
Sowerby's beaked whale	Western North Atlantic	0	3	0	0	0	3	0	0
True's beaked whale	Western North Atlantic	0	3	0	0	0	3	0	0

**Table E.12-1: Estimated Marine Mammal Impacts per 5-Year Period from Explosive Training Activities (continued)**

Species	Stock	Alternative 1 – 5-Year				Alternative 2 – 5-Year			
		Behavioral Response	TTS	PTS	Injury	Behavioral Response	TTS	PTS	Injury
Family Delphinidae (dolphins)									
Atlantic spotted dolphin	Northern Gulf of Mexico	5	25	0	0	5	25	0	0
	Western North Atlantic	165	390	42	3	165	390	42	3
Atlantic white-sided dolphin	Western North Atlantic	14	33	0	0	14	33	0	0
Bottlenose dolphin	Choctawatchee Bay	0	0	0	0	0	0	0	0
	Gulf of Mexico Eastern Coastal	0	0	0	0	0	0	0	0
	Gulf of Mexico Northern Coastal	3	15	0	0	3	15	0	0
	Gulf of Mexico Western Coastal	3	4	0	0	3	4	0	0
	Indian River Lagoon Estuarine System	0	0	0	0	0	0	0	0
	Jacksonville Estuarine System	0	0	0	0	0	0	0	0
	Mississippi Sound, Lake Borgne, Bay Boudreau	0	0	0	0	0	0	0	0
	Northern Gulf of Mexico Continental Shelf	21	109	9	0	21	109	9	0
	Northern Gulf of Mexico Oceanic	10	29	0	0	10	29	0	0

**Table E.12-1: Estimated Marine Mammal Impacts per 5-Year Period from Explosive Training Activities (continued)**

<i>Species</i>	<i>Stock</i>	<i>Alternative 1 – 5-Year</i>				<i>Alternative 2 – 5-Year</i>			
		<i>Behavioral Response</i>	<i>TTS</i>	<i>PTS</i>	<i>Injury</i>	<i>Behavioral Response</i>	<i>TTS</i>	<i>PTS</i>	<i>Injury</i>
	Northern North Carolina Estuarine System	3	0	0	0	3	0	0	0
	Southern North Carolina Estuarine System	0	0	0	0	0	0	0	0
	Western North Atlantic Northern Florida Coastal	3	5	0	0	3	5	0	0
	Western North Atlantic Central Florida Coastal	13	27	0	0	13	27	0	0
	Western North Atlantic Northern Migratory Coastal	57	225	16	0	57	225	16	0
	Western North Atlantic Offshore	421	1,842	134	15	421	1,842	134	15
	Western North Atlantic South Carolina/Georgia Coastal	13	27	0	0	13	27	0	0
	Western North Atlantic Southern Migratory Coastal	52	89	7	0	52	89	7	0
Clymene dolphin	Northern Gulf of Mexico	0	0	0	0	0	0	0	0
	Western North Atlantic	39	100	13	0	39	100	13	0

**Table E.12-1: Estimated Marine Mammal Impacts per 5-Year Period from Explosive Training Activities (continued)**

<i>Species</i>	<i>Stock</i>	<i>Alternative 1 – 5-Year</i>				<i>Alternative 2 – 5-Year</i>			
		<i>Behavioral Response</i>	<i>TTS</i>	<i>PTS</i>	<i>Injury</i>	<i>Behavioral Response</i>	<i>TTS</i>	<i>PTS</i>	<i>Injury</i>
False killer whale	Northern Gulf of Mexico	0	0	0	0	0	0	0	0
	Western North Atlantic	4	9	0	0	4	9	0	0
Fraser's dolphin	Northern Gulf of Mexico	0	0	0	0	0	0	0	0
	Western North Atlantic	0	0	0	0	0	0	0	0
Killer whale	Northern Gulf of Mexico	0	0	0	0	0	0	0	0
	Western North Atlantic	0	0	0	0	0	0	0	0
Long-finned pilot whale	Western North Atlantic	12	21	0	0	12	21	0	0
Melon-headed whale	Northern Gulf of Mexico	0	0	0	0	0	0	0	0
	Western North Atlantic	17	58	3	0	17	58	3	0
Pantropical spotted dolphin	Northern Gulf of Mexico	0	3	0	0	0	3	0	0
	Western North Atlantic	26	56	10	0	26	56	10	0
Pygmy killer whale	Northern Gulf of Mexico	0	0	0	0	0	0	0	0
	Western North Atlantic	3	5	0	0	3	5	0	0
Risso's dolphin	Northern Gulf of Mexico	0	0	0	0	0	0	0	0

**Table E.12-1: Estimated Marine Mammal Impacts per 5-Year Period from Explosive Training Activities (continued)**

<i>Species</i>	<i>Stock</i>	<i>Alternative 1 – 5-Year</i>				<i>Alternative 2 – 5-Year</i>			
		<i>Behavioral Response</i>	<i>TTS</i>	<i>PTS</i>	<i>Injury</i>	<i>Behavioral Response</i>	<i>TTS</i>	<i>PTS</i>	<i>Injury</i>
	Western North Atlantic	8	19	0	0	8	19	0	0
Rough-toothed dolphin	Northern Gulf of Mexico	0	0	0	0	0	0	0	0
	Western North Atlantic	8	23	0	0	8	23	0	0
Short-beaked common dolphin	Western North Atlantic	201	396	59	3	201	396	59	3
Short-finned pilot whale	Northern Gulf of Mexico	0	0	0	0	0	0	0	0
	Western North Atlantic	12	23	0	0	12	23	0	0
Spinner dolphin	Northern Gulf of Mexico	0	0	0	0	0	0	0	0
	Western North Atlantic	22	71	6	0	22	71	6	0
Striped dolphin	Northern Gulf of Mexico	0	0	0	0	0	0	0	0
	Western North Atlantic	36	66	13	0	36	66	13	0
White-beaked dolphin	Western North Atlantic	0	0	0	0	0	0	0	0
<b><i>Family Phocoenidae (porpoises)</i></b>									
Harbor porpoise	Gulf of Maine/Bay of Fundy	528	2,465	744	0	528	2,465	744	0
<b><i>Suborder Pinnipedia</i></b>									
<b><i>Family Phocidae (true seals)</i></b>									
Gray seal	Western North Atlantic	0	0	0	0	0	0	0	0

**Table E.12-1: Estimated Marine Mammal Impacts per 5-Year Period from Explosive Training Activities (continued)**

<i>Species</i>	<i>Stock</i>	<i>Alternative 1 – 5-Year</i>				<i>Alternative 2 – 5-Year</i>			
		<i>Behavioral Response</i>	<i>TTS</i>	<i>PTS</i>	<i>Injury</i>	<i>Behavioral Response</i>	<i>TTS</i>	<i>PTS</i>	<i>Injury</i>
Harbor seal	Western North Atlantic	0	0	0	0	0	0	0	0
Harp seal	Western North Atlantic	0	0	0	0	0	0	0	0
Hooded seal	Western North Atlantic	0	0	0	0	0	0	0	0
<b><i>Order Sirenia</i></b>									
<b><i>Family Trichechidae (manatees)</i></b>									
West Indian manatee*	Florida, Antillean	0	0	0	0	0	0	0	0

\* ESA-listed species (all stocks) within the AFTT Study Area

†NSD: No stock designation

PTS: permanent threshold shift; TTS: temporary threshold shift

## **E.13 ESTIMATED MARINE MAMMAL IMPACTS FROM EXPLOSIVES UNDER NAVY TESTING ACTIVITIES (EXCLUDING SHIP SHOCK TRIALS)**

Table E.13-1 provides a summary of the estimated number of marine mammal impacts from exposure to explosives used during Navy testing activities (excluding ship shock trials) under Alternatives 1 and 2 over the course of a year.

**Table E.13-1: Estimated Marine Mammal Impacts per Year from Explosive Testing Activities (Excluding Ship Shock Trials)**

Species	Stock	Alternative 1 – Minimum				Alternative 1 – Maximum				Alternative 2			
		Behavioral Response	TTS	PTS	Injury	Behavioral Response	TTS	PTS	Injury	Behavioral Response	TTS	PTS	Injury
Suborder Mysticeti (baleen whales)													
Family Balaenidae (right whales)													
North Atlantic right whale*	Western North Atlantic	0	9	0	0	0	10	0	0	0	10	0	0
Family Balaenopteridae (roquals)													
Blue whale*	Western North Atlantic (Gulf of St. Lawrence)	0	0	0	0	0	0	0	0	0	0	0	0
Bryde's whale	Northern Gulf of Mexico	0	0	0	0	0	1	0	0	0	1	0	0
	NSD <sup>†</sup>	0	1	0	0	0	1	0	0	0	1	0	0
Minke whale	Canadian East Coast	0	12	1	0	0	13	1	0	0	16	1	0
Fin whale*	Western North Atlantic	0	34	1	0	0	38	1	0	0	45	2	0
Humpback whale	Gulf of Maine	0	11	0	0	0	11	0	0	0	12	0	0



**Table E.13-1: Estimated Marine Mammal Impacts per Year from Explosive Testing Activities (Excluding Ship Shock Trials) (continued)**

Species	Stock	Alternative 1 – Minimum				Alternative 1 – Maximum				Alternative 2			
		Behavioral Response	TTS	PTS	Injury	Behavioral Response	TTS	PTS	Injury	Behavioral Response	TTS	PTS	Injury
Sei whale*	Nova Scotia	0	4	0	0	0	5	0	0	0	5	0	0
<b>Suborder Odontoceti (toothed whales)</b>													
<b>Family Physeteridae (sperm whale)</b>													
Sperm whale*	Gulf of Mexico Oceanic	0	0	0	0	0	0	0	0	0	0	0	0
	North Atlantic	2	2	0	0	2	3	0	0	2	3	1	0
<b>Family Kogiidae (sperm whales)</b>													
Dwarf sperm whale	Gulf of Mexico Oceanic	4	10	4	0	4	10	5	0	4	12	6	0
	Western North Atlantic	16	19	6	0	20	23	7	0	20	24	7	0
Pygmy sperm whale	Northern Gulf of Mexico	4	10	4	0	4	10	5	0	4	12	6	0
	Western North Atlantic	16	19	6	0	20	23	7	0	20	24	7	0
<b>Family Ziphiidae (beaked whales)</b>													
Blainville's beaked whale	Northern Gulf of Mexico	0	0	0	0	0	0	0	0	0	0	0	0
	Western North Atlantic	1	1	0	0	1	1	0	0	1	1	0	0

**Table E.13-1: Estimated Marine Mammal Impacts per Year from Explosive Testing Activities (Excluding Ship Shock Trials) (continued)**

Species	Stock	Alternative 1 – Minimum				Alternative 1 – Maximum				Alternative 2			
		Behavioral Response	TTS	PTS	Injury	Behavioral Response	TTS	PTS	Injury	Behavioral Response	TTS	PTS	Injury
Cuvier's beaked whale	Northern Gulf of Mexico	0	0	0	0	0	0	0	0	0	0	0	0
	Western North Atlantic	2	2	0	0	3	3	0	0	3	3	0	0
Gervais' beaked whale	Northern Gulf of Mexico	0	0	0	0	0	0	0	0	0	0	0	0
	Western North Atlantic	1	1	0	0	1	1	0	0	1	1	0	0
Northern bottlenose whale	Western North Atlantic	0	0	0	0	0	0	0	0	0	0	0	0
Sowerby's beaked whale	Western North Atlantic	1	1	0	0	1	1	0	0	1	1	0	0
True's beaked whale	Western North Atlantic	1	1	0	0	1	1	0	0	1	1	0	0
<b>Family Delphinidae (dolphins)</b>													
Atlantic spotted dolphin	Northern Gulf of Mexico	25	28	2	0	25	29	2	0	30	34	3	0
	Western North Atlantic	49	57	8	1	63	78	10	1	64	80	11	1

**Table E.13-1: Estimated Marine Mammal Impacts per Year from Explosive Testing Activities (Excluding Ship Shock Trials) (continued)**

<i>Species</i>	<i>Stock</i>	<i>Alternative 1 – Minimum</i>				<i>Alternative 1 – Maximum</i>				<i>Alternative 2</i>			
		<i>Behavioral Response</i>	<i>TTS</i>	<i>PTS</i>	<i>Injury</i>	<i>Behavioral Response</i>	<i>TTS</i>	<i>PTS</i>	<i>Injury</i>	<i>Behavioral Response</i>	<i>TTS</i>	<i>PTS</i>	<i>Injury</i>
Atlantic white-sided dolphin	Western North Atlantic	13	11	1	0	14	13	1	0	14	13	1	0
Bottlenose dolphin	Choctawatchee Bay	1	1	0	0	1	1	0	0	1	1	0	0
	Gulf of Mexico Eastern Coastal	0	0	0	0	0	0	0	0	0	0	0	0
	Gulf of Mexico Northern Coastal	12	15	1	0	12	15	1	0	13	16	1	0
	Gulf of Mexico Western Coastal	2	2	0	0	2	2	0	0	2	2	0	0
	Indian River Lagoon Estuarine System	0	0	0	0	0	0	0	0	0	0	0	0
	Jacksonville Estuarine System	0	0	0	0	0	0	0	0	0	0	0	0
	Mississippi Sound, Lake Borgne, Bay Boudreau	0	0	0	0	0	0	0	0	0	0	0	0

**Table E.13-1: Estimated Marine Mammal Impacts per Year from Explosive Testing Activities (Excluding Ship Shock Trials) (continued)**

Species	Stock	Alternative 1 – Minimum				Alternative 1 – Maximum				Alternative 2			
		Behavioral Response	TTS	PTS	Injury	Behavioral Response	TTS	PTS	Injury	Behavioral Response	TTS	PTS	Injury
	Northern Gulf of Mexico Continental Shelf	88	108	8	0	88	109	8	0	94	114	9	0
	Northern Gulf of Mexico Oceanic	11	13	1	0	11	14	1	0	12	14	1	0
	Northern North Carolina Estuarine System	0	0	0	0	0	0	0	0	0	0	0	0
	Southern North Carolina Estuarine System	0	0	0	0	0	0	0	0	0	0	0	0
	Western North Atlantic Northern Florida Coastal	0	0	0	0	0	0	0	0	0	0	0	0
	Western North Atlantic Central Florida Coastal	1	1	0	0	1	1	0	0	1	1	0	0

**Table E.13-1: Estimated Marine Mammal Impacts per Year from Explosive Testing Activities (Excluding Ship Shock Trials) (continued)**

Species	Stock	Alternative 1 – Minimum				Alternative 1 – Maximum				Alternative 2			
		Behavioral Response	TTS	PTS	Injury	Behavioral Response	TTS	PTS	Injury	Behavioral Response	TTS	PTS	Injury
	Western North Atlantic Northern Migratory Coastal	6	14	2	0	7	15	2	0	7	15	2	0
	Western North Atlantic Offshore	61	111	16	1	68	122	17	1	69	123	18	1
	Western North Atlantic South Carolina/Georgia Coastal	1	1	0	0	1	1	0	0	1	1	0	0
	Western North Atlantic Southern Migratory Coastal	2	2	0	0	2	3	0	0	2	3	0	0
Clymene dolphin	Northern Gulf of Mexico	1	1	0	0	1	1	0	0	1	1	0	0
	Western North Atlantic	11	15	1	0	14	19	2	0	14	20	2	0

**Table E.13-1: Estimated Marine Mammal Impacts per Year from Explosive Testing Activities (Excluding Ship Shock Trials) (continued)**

<i>Species</i>	<i>Stock</i>	<i>Alternative 1 – Minimum</i>				<i>Alternative 1 – Maximum</i>				<i>Alternative 2</i>			
		<i>Behavioral Response</i>	<i>TTS</i>	<i>PTS</i>	<i>Injury</i>	<i>Behavioral Response</i>	<i>TTS</i>	<i>PTS</i>	<i>Injury</i>	<i>Behavioral Response</i>	<i>TTS</i>	<i>PTS</i>	<i>Injury</i>
False killer whale	Northern Gulf of Mexico	0	0	0	0	0	0	0	0	0	0	0	0
	Western North Atlantic	1	2	0	0	1	2	0	0	1	2	0	0
Fraser's dolphin	Northern Gulf of Mexico	0	0	0	0	0	0	0	0	0	0	0	0
	Western North Atlantic	0	0	0	0	0	1	0	0	0	1	0	0
Killer whale	Northern Gulf of Mexico	0	0	0	0	0	0	0	0	0	0	0	0
	Western North Atlantic	0	0	0	0	0	0	0	0	0	0	0	0
Long-finned pilot whale	Western North Atlantic	4	4	1	0	4	5	2	0	5	5	2	0
Melon-headed whale	Northern Gulf of Mexico	0	1	0	0	0	1	0	0	0	1	0	0
	Western North Atlantic	4	5	1	0	6	7	1	0	6	7	1	0
Pantropical spotted dolphin	Northern Gulf of Mexico	4	4	1	0	4	5	1	0	4	5	1	0

**Table E.13-1: Estimated Marine Mammal Impacts per Year from Explosive Testing Activities (Excluding Ship Shock Trials) (continued)**

Species	Stock	Alternative 1 – Minimum				Alternative 1 – Maximum				Alternative 2			
		Behavioral Response	TTS	PTS	Injury	Behavioral Response	TTS	PTS	Injury	Behavioral Response	TTS	PTS	Injury
	Western North Atlantic	17	17	3	0	21	21	4	0	21	21	4	0
Pygmy killer whale	Northern Gulf of Mexico	0	0	0	0	0	0	0	0	0	0	0	0
	Western North Atlantic	1	1	0	0	1	1	0	0	1	1	0	0
Risso's dolphin	Northern Gulf of Mexico	0	0	0	0	0	0	0	0	0	0	0	0
	Western North Atlantic	2	5	1	0	3	6	1	0	3	6	1	0
Rough-toothed dolphin	Northern Gulf of Mexico	2	3	0	0	2	3	0	0	2	3	0	0
	Western North Atlantic	3	3	0	0	3	4	0	0	4	4	0	0
Short-beaked common dolphin	Western North Atlantic	84	99	12	1	100	126	16	1	103	131	17	1
Short-finned pilot whale	Northern Gulf of Mexico	0	1	0	0	0	1	0	0	0	1	0	0
	Western North Atlantic	2	3	1	0	3	4	1	0	3	5	2	0

**Table E.13-1: Estimated Marine Mammal Impacts per Year from Explosive Testing Activities (Excluding Ship Shock Trials) (continued)**

Species	Stock	Alternative 1 – Minimum				Alternative 1 – Maximum				Alternative 2			
		Behavioral Response	TTS	PTS	Injury	Behavioral Response	TTS	PTS	Injury	Behavioral Response	TTS	PTS	Injury
Spinner dolphin	Northern Gulf of Mexico	1	2	0	0	1	3	0	0	3	4	1	0
	Western North Atlantic	11	14	1	0	14	19	2	0	14	19	2	0
Striped dolphin	Northern Gulf of Mexico	0	0	0	0	0	0	0	0	0	0	0	0
	Western North Atlantic	19	19	4	0	23	24	5	0	24	25	5	0
White-beaked dolphin	Western North Atlantic	0	0	0	0	0	0	0	0	0	0	0	0
<b>Family Phocoenidae (porpoises)</b>													
Harbor porpoise	Gulf of Maine/Bay of Fundy	463	654	170	0	503	724	187	0	504	748	213	0
<b>Suborder Pinnipedia</b>													
<b>Family Phocidae (true seals)</b>													
Gray seal	Western North Atlantic	5	5	0	0	6	5	0	0	6	5	0	0
Harbor seal	Western North Atlantic	9	8	1	0	9	8	1	0	9	8	1	0
Harp seal	Western North Atlantic	34	30	2	0	34	30	2	0	34	30	2	0



**Table E.13-1: Estimated Marine Mammal Impacts per Year from Explosive Testing Activities (Excluding Ship Shock Trials) (continued)**

<i>Species</i>	<i>Stock</i>	<i>Alternative 1 – Minimum</i>				<i>Alternative 1 – Maximum</i>				<i>Alternative 2</i>			
		<i>Behavioral Response</i>	<i>TTS</i>	<i>PTS</i>	<i>Injury</i>	<i>Behavioral Response</i>	<i>TTS</i>	<i>PTS</i>	<i>Injury</i>	<i>Behavioral Response</i>	<i>TTS</i>	<i>PTS</i>	<i>Injury</i>
Hooded seal	Western North Atlantic	3	2	0	0	3	2	0	0	3	2	0	0
<b><i>Order Sirenia</i></b>													
<b><i>Family Trichechidae (manatees)</i></b>													
West Indian manatee*	Florida, Antillean	0	0	0	0	0	0	0	0	0	0	0	0

\* ESA-listed species (all stocks) within the AFTT Study Area

†NSD: No stock designation

PTS: permanent threshold shift; TTS: temporary threshold shift

## **E.14 ESTIMATED MARINE MAMMAL IMPACTS PER FIVE YEAR PERIOD FROM EXPLOSIVES UNDER NAVY TESTING ACTIVITIES (EXCLUDING SHIP SHOCK TRIALS)**

Table E.14-1 provides a summary of the estimated number of marine mammal impacts from exposure to explosives used during Navy testing activities (excluding ship shock trials) under Alternatives 1 and 2 over the course of five years.

**Table E.14-1: Estimated Marine Mammal Impacts per 5-Year Period from Explosive Testing Activities (Excluding Ship Shock Trials)**

Species	Stock	Alternative 1 – 5-Year				Alternative 2 – 5-Year			
		Behavioral Response	TTS	PTS	Injury	Behavioral Response	TTS	PTS	Injury
Suborder Mysticeti (baleen whales)									
Family Balaenidae (right whales)									
North Atlantic right whale*	Western North Atlantic	0	48	0	0	0	49	0	0
Family Balaenopteridae (roquals)									
Blue whale*	Western North Atlantic (Gulf of St. Lawrence)	0	0	0	0	0	0	0	0
Bryde's whale	Northern Gulf of Mexico	0	3	0	0	0	5	0	0
	NSD <sup>†</sup>	0	6	0	0	0	7	0	0
Minke whale	Canadian East Coast	0	63	4	0	0	78	4	0
Fin whale*	Western North Atlantic	0	177	7	0	0	225	9	0
Humpback whale	Gulf of Maine	0	54	0	0	0	60	0	0
Sei whale*	Nova Scotia	0	22	0	0	0	26	0	0
Suborder Odontoceti (toothed whales)									
Family Physeteridae (sperm whale)									
Sperm whale*	Gulf of Mexico Oceanic	0	0	0	0	0	0	0	0
	North Atlantic	9	12	0	0	11	15	3	0
Family Kogiidae (sperm whales)									
Dwarf sperm whale	Gulf of Mexico Oceanic	21	49	22	0	22	61	29	0
	Western North Atlantic	91	106	32	0	98	120	37	0

**TableE.14-1: Estimated Marine Mammal Impacts per 5-Year Period from Explosive Testing Activities (Excluding Ship Shock Trials) (continued)**

<i>Species</i>	<i>Stock</i>	<i>Alternative 1 – 5-Year</i>				<i>Alternative 2 – 5-Year</i>			
		<i>Behavioral Response</i>	<i>TTS</i>	<i>PTS</i>	<i>Injury</i>	<i>Behavioral Response</i>	<i>TTS</i>	<i>PTS</i>	<i>Injury</i>
Pygmy sperm whale	Northern Gulf of Mexico	21	49	22	0	22	61	29	0
	Western North Atlantic	91	106	32	0	98	120	37	0
<b><i>Family Ziphiidae (beaked whales)</i></b>									
Blainville's beaked whale	Northern Gulf of Mexico	0	0	0	0	0	0	0	0
	Western North Atlantic	4	4	0	0	4	4	0	0
Cuvier's beaked whale	Northern Gulf of Mexico	0	0	0	0	0	0	0	0
	Western North Atlantic	13	14	0	0	14	16	0	0
Gervais' beaked whale	Northern Gulf of Mexico	0	0	0	0	0	0	0	0
	Western North Atlantic	4	4	0	0	4	4	0	0
Northern bottlenose whale	Western North Atlantic	0	0	0	0	0	0	0	0
Sowerby's beaked whale	Western North Atlantic	4	4	0	0	4	4	0	0
True's beaked whale	Western North Atlantic	4	4	0	0	4	4	0	0

**TableE.14-1: Estimated Marine Mammal Impacts per 5-Year Period from Explosive Testing Activities (Excluding Ship Shock Trials) (continued)**

Species	Stock	Alternative 1 – 5-Year				Alternative 2 – 5-Year			
		Behavioral Response	TTS	PTS	Injury	Behavioral Response	TTS	PTS	Injury
Family Delphinidae (dolphins)									
Atlantic spotted dolphin	Northern Gulf of Mexico	126	141	12	0	152	169	16	0
	Western North Atlantic	287	343	46	4	322	398	53	5
Atlantic white-sided dolphin	Western North Atlantic	67	60	6	0	71	67	6	0
Bottlenose dolphin	Choctawatchee Bay	5	6	0	0	5	6	0	0
	Gulf of Mexico Eastern Coastal	0	0	0	0	0	0	0	0
	Gulf of Mexico Northern Coastal	61	75	5	0	65	79	6	0
	Gulf of Mexico Western Coastal	12	10	0	0	12	11	0	0
	Indian River Lagoon Estuarine System	0	0	0	0	0	0	0	0
	Jacksonville Estuarine System	0	0	0	0	0	0	0	0
	Mississippi Sound, Lake Borgne, Bay Boudreau	0	0	0	0	0	0	0	0
	Northern Gulf of Mexico Continental Shelf	442	544	39	0	469	572	45	0
	Northern Gulf of Mexico Oceanic	56	68	5	0	59	71	6	0
	Northern North Carolina Estuarine System	0	0	0	0	0	0	0	0

**TableE.14-1: Estimated Marine Mammal Impacts per 5-Year Period from Explosive Testing Activities (Excluding Ship Shock Trials) (continued)**

<i>Species</i>	<i>Stock</i>	<i>Alternative 1 – 5-Year</i>				<i>Alternative 2 – 5-Year</i>			
		<i>Behavioral Response</i>	<i>TTS</i>	<i>PTS</i>	<i>Injury</i>	<i>Behavioral Response</i>	<i>TTS</i>	<i>PTS</i>	<i>Injury</i>
	Southern North Carolina Estuarine System	0	0	0	0	0	0	0	0
	Western North Atlantic Northern Florida Coastal	0	0	0	0	0	0	0	0
	Western North Atlantic Central Florida Coastal	6	6	0	0	6	6	0	0
	Western North Atlantic Northern Migratory Coastal	33	71	11	0	35	75	12	0
	Western North Atlantic Offshore	323	583	84	5	344	616	88	5
	Western North Atlantic South Carolina/Georgia Coastal	6	6	0	0	6	6	0	0
	Western North Atlantic Southern Migratory Coastal	11	11	0	0	12	13	0	0
Clymene dolphin	Northern Gulf of Mexico	4	3	0	0	4	4	0	0
	Western North Atlantic	63	87	7	0	70	98	9	0
False killer whale	Northern Gulf of Mexico	0	0	0	0	0	0	0	0
	Western North Atlantic	5	10	0	0	6	12	0	0

**TableE.14-1: Estimated Marine Mammal Impacts per 5-Year Period from Explosive Testing Activities (Excluding Ship Shock Trials) (continued)**

<i>Species</i>	<i>Stock</i>	<i>Alternative 1 – 5-Year</i>				<i>Alternative 2 – 5-Year</i>			
		<i>Behavioral Response</i>	<i>TTS</i>	<i>PTS</i>	<i>Injury</i>	<i>Behavioral Response</i>	<i>TTS</i>	<i>PTS</i>	<i>Injury</i>
Fraser's dolphin	Northern Gulf of Mexico	0	0	0	0	0	0	0	0
	Western North Atlantic	0	3	0	0	0	4	0	0
Killer whale	Northern Gulf of Mexico	0	0	0	0	0	0	0	0
	Western North Atlantic	0	0	0	0	0	0	0	0
Long-finned pilot whale	Western North Atlantic	20	23	6	0	24	27	8	0
Melon-headed whale	Northern Gulf of Mexico	0	3	0	0	0	3	0	0
	Western North Atlantic	25	32	4	0	29	37	4	0
Pantropical spotted dolphin	Northern Gulf of Mexico	19	23	4	0	22	26	5	0
	Western North Atlantic	96	95	17	0	106	107	19	0
Pygmy killer whale	Northern Gulf of Mexico	0	0	0	0	0	0	0	0
	Western North Atlantic	3	6	0	0	4	7	0	0
Risso's dolphin	Northern Gulf of Mexico	0	0	0	0	0	0	0	0
	Western North Atlantic	14	27	6	0	16	32	7	0
Rough-toothed dolphin	Northern Gulf of Mexico	11	14	0	0	11	15	0	0
	Western North Atlantic	16	18	0	0	18	21	0	0

**TableE.14-1: Estimated Marine Mammal Impacts per 5-Year Period from Explosive Testing Activities (Excluding Ship Shock Trials) (continued)**

<i>Species</i>	<i>Stock</i>	<i>Alternative 1 – 5-Year</i>				<i>Alternative 2 – 5-Year</i>			
		<i>Behavioral Response</i>	<i>TTS</i>	<i>PTS</i>	<i>Injury</i>	<i>Behavioral Response</i>	<i>TTS</i>	<i>PTS</i>	<i>Injury</i>
Short-beaked common dolphin	Western North Atlantic	463	563	68	3	516	657	86	5
Short-finned pilot whale	Northern Gulf of Mexico	0	4	0	0	0	4	0	0
	Western North Atlantic	12	20	6	0	14	23	8	0
Spinner dolphin	Northern Gulf of Mexico	6	13	0	0	13	20	3	0
	Western North Atlantic	63	82	7	0	70	94	8	0
Striped dolphin	Northern Gulf of Mexico	0	0	0	0	0	0	0	0
	Western North Atlantic	104	107	21	0	121	124	25	0
White-beaked dolphin	Western North Atlantic	0	0	0	0	0	0	0	0
<b><i>Family Phocoenidae (porpoises)</i></b>									
Harbor porpoise	Gulf of Maine/Bay of Fundy	2,411	3,417	887	0	2,520	3,739	1,064	0
<b><i>Suborder Pinnipedia</i></b>									
<b><i>Family Phocidae (true seals)</i></b>									
Gray seal	Western North Atlantic	27	24	0	0	28	24	0	0
Harbor seal	Western North Atlantic	44	39	3	0	45	39	3	0
Harp seal	Western North Atlantic	170	150	11	0	172	151	11	0
Hooded seal	Western North Atlantic	13	11	0	0	13	11	0	0



**TableE.14-1: Estimated Marine Mammal Impacts per 5-Year Period from Explosive Testing Activities (Excluding Ship Shock Trials) (continued)**

Species	Stock	Alternative 1 – 5-Year				Alternative 2 – 5-Year			
		Behavioral Response	TTS	PTS	Injury	Behavioral Response	TTS	PTS	Injury
Order Sirenia									
Family Trichechidae (manatees)									
West Indian manatee*	Florida, Antillean	0	0	0	0	0	0	0	0

\* ESA-listed species (all stocks) within the AFTT Study Area

†NSD: No stock designation

PTS: permanent threshold shift; TTS: temporary threshold shift

## **E.15 ESTIMATED MARINE MAMMAL IMPACTS FROM SHIP SHOCK TRIALS UNDER NAVY TESTING ACTIVITIES**

Table E.15-1 provides a summary of the estimated number of marine mammal impacts from exposure to Navy ship shock trials (an explosive testing activity) under Alternatives 1 and 2 from small and large shock trials, and over the course of five years. The small ship shock trial could take place up to 3 times over a five-year period and the large ship shock trial could take place once. Takes per species below are the maximum for any proposed location and season. Stock designations are not provided since they are highly dependent on the actual location chosen for each shock trial. See Chapter 2 (Description of Proposed Action and Alternatives) for details on locations and seasons for ship shock trials.

**Table E.15-1: Estimated Marine Mammal Impacts from Small and Large Ship Shock Trials (Explosive Testing Activity) and per 5-Year Period**

Species	Small Ship Shock				Large Ship Shock				5-Year Total			
	TTS	PTS	Injury	Mortality	TTS	PTS	Injury	Mortality	TTS	PTS	Injury	Mortality
<b>Suborder Mysticeti (baleen whales)</b>												
<b>Family Balaenidae (right whales)</b>												
North Atlantic right whale*	1	0	0	0	2	0	0	0	5	0	0	0
<b>Family Balaenopteridae (roquals)</b>												
Blue whale*	0	0	0	0	1	0	0	0	1	0	0	0
Bryde's whale	3	0	0	0	6	1	0	0	15	1	0	0
Minke whale	19	1	0	0	39	3	0	0	96	6	0	0
Fin whale*	131	3	0	0	234	27	0	0	627	36	0	0
Humpback whale	8	0	0	0	20	2	0	0	44	2	0	0
Sei whale*	12	1	0	0	27	4	0	0	63	7	0	0
<b>Suborder Odontoceti (toothed whales)</b>												
<b>Family Physeteridae (sperm whale)</b>												
Sperm whale*	1	1	0	0	3	3	1	0	6	6	1	0
<b>Family Kogiidae (sperm whales)</b>												
Dwarf sperm whale	46	28	0	0	91	70	0	0	229	154	0	0
Pygmy sperm whale	46	28	0	0	91	70	0	0	229	154	0	0
<b>Family Ziphiidae (beaked whales)</b>												
Blainville's beaked whale	1	0	0	0	1	1	0	0	4	1	0	0
Cuvier's beaked whale	2	1	0	0	2	3	0	0	8	6	0	0
Gervais' beaked whale	1	0	0	0	1	1	0	0	4	1	0	0
Northern bottlenose whale	0	0	0	0	0	0	0	0	0	0	0	0
Sowersby's beaked whale	1	0	0	0	1	1	0	0	4	1	0	0
True's beaked whale	1	0	0	0	1	1	0	0	4	1	0	0

**Table E.15-1: Estimated Marine Mammal Impacts from Small and Large Ship Shock Trials (Explosive Testing Activity) and per 5-Year Period (continued)**

<i>Species</i>	<i>Small Ship Shock</i>				<i>Large Ship Shock</i>				<i>5-Year Total</i>			
	<i>TTS</i>	<i>PTS</i>	<i>Injury</i>	<i>Mortality</i>	<i>TTS</i>	<i>PTS</i>	<i>Injury</i>	<i>Mortality</i>	<i>TTS</i>	<i>PTS</i>	<i>Injury</i>	<i>Mortality</i>
<b><i>Family Delphinidae (dolphins)</i></b>												
Atlantic spotted dolphin	6	3	1	0	8	8	4	0	26	17	7	0
Atlantic white-sided dolphin	1	1	0	0	3	6	3	1	6	9	3	1
Bottlenose dolphin	13	8	2	0	16	19	5	0	55	43	11	0
Clymene dolphin	2	4	1	0	9	5	3	0	15	17	6	0
False killer whale	0	0	0	0	2	1	0	0	2	1	0	0
Fraser's dolphin	0	0	0	0	2	2	1	0	2	2	1	0
Killer whale	0	0	0	0	0	0	0	0	0	0	0	0
Long-finned pilot whale	2	2	0	0	5	5	1	0	11	11	1	0
Melon-headed whale	1	1	0	0	5	3	1	0	8	6	1	0
Pantropical spotted dolphin	2	2	1	0	25	14	6	1	31	20	9	1
Pygmy killer whale	0	0	0	0	1	1	0	0	1	1	0	0
Risso's dolphin	1	1	0	0	3	1	0	0	6	4	0	0
Rough-toothed dolphin	1	0	0	0	3	1	1	0	6	1	1	0
Short-beaked common dolphin	40	40	11	1	67	73	34	3	187	193	67	6
Short-finned pilot whale	2	2	0	0	4	4	1	0	10	10	1	0
Spinner dolphin	3	1	0	0	37	31	14	1	46	34	14	1
Striped dolphin	4	6	2	0	10	8	4	0	22	26	10	0
White-beaked dolphin	0	0	0	0	0	0	0	0	0	0	0	0
<b><i>Family Phocoenidae (porpoises)</i></b>												
Harbor porpoise	43	41	0	0	120	81	0	0	249	204	0	0
<b><i>Suborder Pinnipedia</i></b>												
<b><i>Family Phocidae (true seals)</i></b>												
Gray seal	0	0	0	0	0	0	0	0	0	0	0	0
Harbor seal	0	0	0	0	0	0	0	0	0	0	0	0

**Table E.15-1: Estimated Marine Mammal Impacts from Small and Large Ship Shock Trials (Explosive Testing Activity) and per 5-Year Period (continued)**

<i>Species</i>	<i>Small Ship Shock</i>				<i>Large Ship Shock</i>				<i>5-Year Total</i>			
	<i>TTS</i>	<i>PTS</i>	<i>Injury</i>	<i>Mortality</i>	<i>TTS</i>	<i>PTS</i>	<i>Injury</i>	<i>Mortality</i>	<i>TTS</i>	<i>PTS</i>	<i>Injury</i>	<i>Mortality</i>
Harp seal	0	0	0	0	0	0	0	0	0	0	0	0
Hooded seal	0	0	0	0	0	0	0	0	0	0	0	0
<b><i>Order Sirenia</i></b>												
<b><i>Family Trichechidae (manatees)</i></b>												
West Indian manatee*	0	0	0	0	0	0	0	0	0	0	0	0

\* ESA-listed species (all stocks) within the AFTT Study Area

PTS: permanent threshold shift; TTS: temporary threshold shift

## E.16 ESTIMATED SEA TURTLE IMPACTS FROM SONAR AND OTHER TRANSDUCERS DURING NAVY TRAINING AND TESTING ACTIVITIES

Table E.16-1 provides a summary of the estimated number of sea turtle impacts from exposure to sonar and other transducers used during Navy training and testing activities under Alternatives 1 and 2 over the course of a year.

**Table E.16-1: Estimated Sea Turtle Impacts per Year from Sonar Training and Testing Activities**

<i>Species</i>	<i>Alternative 1 – Minimum</i>		<i>Alternative 1 – Maximum</i>		<i>Alternative 2</i>	
	<i>TTS</i>	<i>PTS</i>	<i>TTS</i>	<i>PTS</i>	<i>TTS</i>	<i>PTS</i>
<b><i>Sonar Training Activities</i></b>						
<b><i>Family Cheloniidae (hardshell turtles)</i></b>						
Green turtle*	0	0	0	0	0	0
Hawksbill turtle*	0	0	0	0	0	0
Kemp's ridley turtle*	0	0	0	0	0	0
Loggerhead turtle*	0	0	0	0	0	0
<b><i>Family Dermochelyidae (scuteless turtles)</i></b>						
Leatherback turtle*	0	0	0	0	0	0
<b><i>Sonar Testing Activities</i></b>						
<b><i>Family Cheloniidae (hardshell turtles)</i></b>						
Green turtle*	0	0	0	0	0	0
Hawksbill turtle*	0	0	0	0	0	0
Kemp's ridley turtle*	1	0	1	0	1	0
Loggerhead turtle*	6	0	6	0	6	0
<b><i>Family Dermochelyidae (scuteless turtles)</i></b>						
Leatherback turtle*	1	0	1	0	1	0

\* ESA-listed species within the AFTT Study Area

PTS: permanent threshold shift; TTS: temporary threshold shift

## E.17 ESTIMATED SEA TURTLE IMPACTS PER FIVE YEAR PERIOD FROM SONAR AND OTHER TRANSDUCERS UNDER NAVY TRAINING AND TESTING ACTIVITIES

Table E.17-1 provides a summary of the estimated number of sea turtle impacts from exposure to sonar and other transducers used during Navy training and testing activities under Alternatives 1 and 2 over the course of five years.

**Table E.17-1: Estimated Sea Turtle Impacts per 5-Year Period from Sonar Training and Testing Activities**

<i>Species</i>	<i>Alternative 1 – 5-Year</i>		<i>Alternative 2 – 5-Year</i>	
	<i>TTS</i>	<i>PTS</i>	<i>TTS</i>	<i>PTS</i>
<b><i>Sonar Training Activities</i></b>				
<b><i>Family Cheloniidae (hardshell turtles)</i></b>				
Green turtle*	0	0	0	0
Hawksbill turtle*	0	0	0	0
Kemp's ridley turtle*	0	0	0	0
Loggerhead turtle*	0	0	0	0
<b><i>Family Dermochelyidae (scuteless turtles)</i></b>				
Leatherback turtle*	0	0	0	0
<b><i>Sonar Testing Activities</i></b>				
<b><i>Family Cheloniidae (hardshell turtles)</i></b>				
Green turtle*	0	0	0	0
Hawksbill turtle*	0	0	0	0
Kemp's ridley turtle*	3	0	3	0
Loggerhead turtle*	32	0	32	0
<b><i>Family Dermochelyidae (scuteless turtles)</i></b>				
Leatherback turtle*	3	0	3	0

\* ESA-listed species within the AFTT Study Area

PTS: permanent threshold shift; TTS: temporary threshold shift

## **E.18 ESTIMATED SEA TURTLE IMPACTS FROM AIR GUNS UNDER NAVY TRAINING AND TESTING ACTIVITIES**

There are no air gun activities under training, therefore there are no anticipated takes. No sea turtle impacts are anticipated from exposure to air guns used during Navy testing activities under Alternatives 1 and 2 over the course of a year and over the course of five years.

## **E.19 ESTIMATED SEA TURTLE IMPACTS FROM PILE DRIVING UNDER NAVY TRAINING AND TESTING ACTIVITIES**

No sea turtle impacts are anticipated from exposure to pile driving used during Navy testing activities under Alternatives 1 and 2 over the course of a year and over the course of five years. There are no pile driving activities under testing, therefore there are no anticipated takes.

## **E.20 ESTIMATED SEA TURTLE IMPACTS FROM EXPLOSIVES UNDER NAVY TRAINING AND TESTING ACTIVITIES**

Table E.20-1 provides a summary of the estimated number of sea turtle impacts from exposure to explosives used during Navy training and testing activities, excluding ship shock trials, under Alternatives 1 and 2 over the course of a year.

**Table E.20-1: Estimated Sea Turtle Impacts per Year from Explosive Training and Testing Activities**

<i>Species</i>	<i>Alternative 1 – Minimum</i>			<i>Alternative 1 – Maximum</i>			<i>Alternative 2</i>		
	<i>TTS</i>	<i>PTS</i>	<i>Injury</i>	<i>TTS</i>	<i>PTS</i>	<i>Injury</i>	<i>TTS</i>	<i>PTS</i>	<i>Injury</i>
<b><i>Explosive Training Activities</i></b>									
<b><i>Family Cheloniidae (hardshell turtles)</i></b>									
Green turtle*	2	1	0	2	1	0	2	1	0
Hawksbill turtle*	0	0	0	0	0	0	0	0	0
Kemp's ridley turtle*	3	2	0	3	2	0	3	2	0
Loggerhead turtle*	57	26	4	57	26	4	57	26	4
<b><i>Family Dermochelyidae (scuteless turtles)</i></b>									
Leatherback turtle*	5	2	0	5	2	0	5	2	0
<b><i>Explosive Testing Activities (Excluding Ship Shock Trials)</i></b>									
<b><i>Family Cheloniidae (hardshell turtles)</i></b>									
Green turtle*	2	1	0	2	2	0	3	2	0
Hawksbill turtle*	0	0	0	0	0	0	0	0	0
Kemp's ridley turtle*	3	1	0	4	1	0	4	2	0
Loggerhead turtle*	26	12	2	29	15	3	34	16	3
<b><i>Family Dermochelyidae (scuteless turtles)</i></b>									
Leatherback turtle*	3	1	0	4	1	0	4	1	0

\* ESA-listed species within the AFTT Study Area

PTS: permanent threshold shift; TTS: temporary threshold shift

## E.21 ESTIMATED SEA TURTLE IMPACTS PER FIVE YEAR PERIOD FROM EXPLOSIVES UNDER NAVY TRAINING AND TESTING ACTIVITIES

Table E.21-1 provides a summary of the estimated number of sea turtle impacts from exposure to explosives used during Navy training and testing activities, excluding ship shock trials, under Alternatives 1 and 2 per five year period.



**Table E.21-1: Estimated Sea Turtle Impacts per 5-Year Period from Explosive Training and Testing Activities (Excluding Ship Shock Trials)**

<i>Species</i>	<i>Alternative 1 – 5-Year</i>			<i>Alternative 2 – 5-Year</i>		
	<i>TTS</i>	<i>PTS</i>	<i>Injury</i>	<i>TTS</i>	<i>PTS</i>	<i>Injury</i>
<b><i>Explosive Training Activities</i></b>						
<b><i>Family Cheloniidae (hardshell turtles)</i></b>						
Green turtle*	12	5	0	12	5	0
Hawksbill turtle*	0	0	0	0	0	0
Kemp's ridley turtle*	17	12	0	17	12	0
Loggerhead turtle*	287	131	18	287	131	18
<b><i>Family Dermochelyidae (scuteless turtles)</i></b>						
Leatherback turtle*	23	10	0	23	10	0
<b><i>Explosive Testing Activities (Excluding Ship Shock Trials)</i></b>						
<b><i>Family Cheloniidae (hardshell turtles)</i></b>						
Green turtle*	12	8	0	13	8	0
Hawksbill turtle*	0	0	0	0	0	0
Kemp's ridley turtle*	16	6	0	22	8	0
Loggerhead turtle*	135	67	12	171	82	14
<b><i>Family Dermochelyidae (scuteless turtles)</i></b>						
Leatherback turtle*	18	4	0	21	6	0

\* ESA-listed species within the AFTT Study Area

PTS: permanent threshold shift; TTS: temporary threshold shift

## E.22 ESTIMATED SEA TURTLE IMPACTS FROM SHIP SHOCK TRIALS UNDER NAVY TESTING ACTIVITIES

Table E.22-1 provides a summary of the estimated number of sea turtle impacts from exposure to Navy ship shock trials (an explosive testing activity) under Alternatives 1 and 2 from small and large shock trials, and over the course of five years. The small ship shock trial could take place up to 3 times over a five-year period and the large ship shock trial could take place once. Takes per species below are the maximum for any proposed location and season. See Chapter 2 (Description of Proposed Action and Alternatives) for details on locations and seasons for ship shock trials.

**Table E.22-1: Estimated Sea Turtle Impacts from Small and Large Ship Shock Trials (Explosive Testing Activity) and per 5-Year Period**

<i>Species</i>	<i>Small Ship Shock</i>				<i>Large Ship Shock</i>				<i>5-Year Total</i>			
	<i>TTS</i>	<i>PTS</i>	<i>Injury</i>	<i>Mortality</i>	<i>TTS</i>	<i>PTS</i>	<i>Injury</i>	<i>Mortality</i>	<i>TTS</i>	<i>PTS</i>	<i>Injury</i>	<i>Mortality</i>
<b><i>Family Cheloniidae (hardshell turtles)</i></b>												
Green turtle*	18	1	0	0	18	1	0	0	72	4	0	0
Hawksbill turtle*	2	0	0	0	2	0	0	0	8	0	0	0
Kemp's ridley turtle*	12	1	0	0	15	1	1	0	51	4	1	0
Loggerhead turtle*	339	19	5	1	283	13	4	1	1,300	70	19	4
<b><i>Family Dermochelyidae (scuteless turtles)</i></b>												
Leatherback turtle*	169	7	1	0	215	7	2	0	722	28	5	0

\* ESA-listed species within the AFTT Study Area

PTS: permanent threshold shift; TTS: temporary threshold shift

## References

U.S. Department of the Navy. (2018). *Quantifying Acoustic Impacts on Marine Mammals and Sea Turtles: Methods and Analytical Approach for Phase III Training and Testing* (Technical Report prepared by NUWC Division Newport, Space and Naval Warfare Systems Center Pacific, G2 Software Systems, and the National Marine Mammal Foundation). Newport, RI: Naval Undersea Warfare Center.

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