US Army Corps of Engineers®
Portland District

Draft Supplemental Environmental Assessment (with Draft Amended FONSI) and Clean Water Act Section 404(b)(1) Alternatives Analysis

Caspian Tern Nesting Island Construction Project
Lower Klamath National Wildlife Refuge
Siskiyou and Modoc Counties, California

U.S. Army Corps of Engineers, Portland District
June 2017

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ACRONYMS AND ABBREVIATIONS

BO .....Biological Opinion
EA .....Environmental Assessment
ESA .....Endangered Species Act
EIS.....Environmental Impact Statement
FEIS .....Final Environmental Impact Statement
FONSI.....Finding of No Significant Impact
Lower Klamath Refuge.....Lower Klamath National Wildlife Refuge
NEPA .....National Environmental Policy Act
NGVD.....National Geodetic Vertical Datum
NMFS.....NOAA's National Marine Fisheries Service
ROD .....Record of Decision
SEA.....Supplemental Environmental Assessment
The Corps.....United States Army Corps of Engineers, Portland District
USDA.....United States Department of Agriculture
Fish & Wildlife .....United States Fish and Wildlife Service

1.0 PROPOSED PROJECT

1.1 Proposed Project Description

This Supplemental Environmental Assessment (SEA) evaluates the environmental effects of demolishing a floating island within the Lower Klamath National Wildlife Refuge (Lower Klamath Refuge) and constructing a permanent island made of rock in its place. The effects of constructing a floating island within the Lower Klamath Refuge, as well as the construction of permanent islands at other U.S. Fish and Wildlife Service (Fish & Wildlife) refuges, were evaluated in a 2009 Environmental Assessment.

The Council on Environmental Quality regulations, 40 CFR § 1500.1(c) and 40 CFR § 1508.9(a)(1), which interpret the National Environmental Policy Act of 1969 (NEPA), require that federal agencies "provide sufficient evidence and analysis for determining whether to prepare an environmental impact statement or a finding of no significant impact" on actions authorized, funded, or carried out by the Federal government. These regulations help officials carefully consider all environmental consequences so that they will "take actions that protect, restore and enhance the environment." The Corps has prepared this draft SEA in the spirit of 40 C.F.R. § 1502.9(c)(1)(i) because it is changing the proposed action described in the 2009 Environmental Assessment (EA) to accommodate the above-proposed maintenance activities at one of the islands in the Lower Klamath Refuge managed by Fish & Wildlife.

The Corps prepared the 2009 EA and a Finding of No Significant Impact (FONSI) for the proposed construction of an island in Sump 1B at Tule Lake National Wildlife Refuge and two islands within wetland management units at the Lower Klamath Refuge to provide nesting habitat for Caspian terns (*Hydroprogne caspia;* formerly *Sterna caspia*). The primary purpose of the proposed action was to develop alternative nesting habitat locations for Caspian terns, in conjunction with social facilitation measures, with the intention of reducing the number of terns nesting at East Sand Island in the Columbia River Estuary, thereby reducing their predation on juvenile salmonids through the estuary. The original EA provides greater background information on the events leading to the original proposed action, which constituted a portion of the environmentally preferred management alternative identified in the Corps' November 22, 2006 Record of Decision (ROD) (USACE 2006) on adoption of the 2005 *Caspian Tern Management to Reduce Predation of Juvenile Salmonids in the Columbia River Estuary* Final Environmental Impact Statement (FEIS) (USFWS 2005), each of which are hereby incorporated by reference.

Following the 2009 EA-FONSI, the Corps implemented the proposed action, by constructing three islands in 2009 and 2010. The Sump 1B and Orems Unit Islands are permanent rock islands constructed under the original EA-FONSI and are functioning as designed. Since the proposed action in this SEA is one for which a previous EA has been prepared, this SEA incorporates by reference analysis from the previous EA in accordance with 40 C.F.R. § 1502.21. As a result, this SEA does not repeat evaluations presented in the prior NEPA document but rather incorporates discussions from this document by reference and concentrates on new issues specific to these subsequent actions.

1.2 Proposed Project Location

The Lower Klamath Refuge is managed within Fish & Wildlife's Klamath Basin National Wildlife Refuges Complex (Figure 1.1), which is approximately 140 miles inland from the west coast of California and Oregon. Sheepy Lake is located within Siskiyou County, California, near the Oregon state border. The 50,092-acre refuge is comprised of a varied mix of intensively managed shallow marshes, open water, grassy uplands, and croplands that provide feeding, resting, nesting, and brood-rearing habitat for waterfowl and other water birds. Sheepy Lake is in the western portion of the Refuge and is approximately 430 acres in size. The current floating island is located at (41º 58' 03.278" N 121º 47' 30.30" W) and is the proposed location of the rock island. It is approximately three miles to Stateline Road to the north.

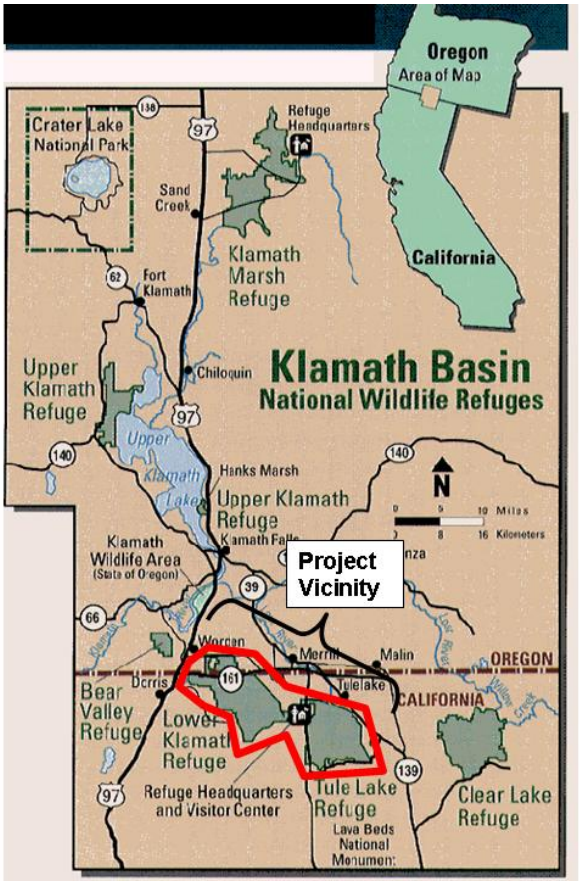


Figure 1.1 Map of Tule Lake NWR and Lower Klamath NWR within the vicinity of Klamath Basin NWRs, Oregon and California.

1.3 Purpose and Need for Proposed Action

The purpose of the current proposed action remains the same as the previous (2009) EA which is to implement a component of the environmentally preferred management alternative, modified Alternative C, as identified in the Corps' November 22, 2006 ROD (USACE 2006). The difference between the EA and this SEA being a change to the proposed action to accommodate a permanent island with a minimum of 0.8 acres of tern nesting habitat at Sheepy Lake instead of a floating island. In conjunction with all other Corps-built alternative tern nesting acres, the 0.8

acres of habitat at Sheepy Lake allows for the continued management of one acre of tern nesting habitat at East Sand Island.

The need for the proposed action is derived from the floating island at Sheepy Lake ongoing deterioration and being at risk of complete failure. The floating island is experiencing multiple failure points in both design and construction which has increased the frequency and costs associated with operation and maintenance beyond what is sustainable for the federal government. The proposed action would replace the existing floating island with a permanent rock island, similar to the Corps 2008 constructed island at Crump Lake in Lake County Oregon. The construction methods and the range of potential effects of a rock structure requires a re-evaluation of the site-specific effects not addressed in the 2009 EA. The evaluation contained herein will include additional acreage, beyond the current 0.8 acres, in light of the fact that Caspian tern habitat is at or near capacity considering due to a variety of other colonial nesting birds using the island.

1.4 Project Authority

The proposed action is authorized under Section 906(b)(1) of the Water Resources Development Act of 1986. This action, in concert with comparable actions at other western region locations (Table 1.1), is intended to continue availability of alternative habitat for Caspian terns outside of the Columbia River Estuary and allow for a minimum amount of managed habitat in the estuary. The intent is to reduce the number of nesting pairs in the estuary, thereby reducing the number of juvenile salmonids consumed annually by Caspian terns. The proposed action is consistent with management objectives for the Lower Klamath Refuge, such as protecting native habitats and wildlife representative of the natural biological diversity of the Klamath Basin.

Table 1.1 Caspian Tern Habitat Completed

Year	Caspian tern habitat site
2008	Fern Ridge, OR
	Crump Lake, OR
	Summer Lake, OR -- East Link Island
2009	Summer Lake, OR – Gold Dike Island
	Lower Klamath NWR, CA-Orems 1 Unit
	Tule Lake NWR, CA- Sump 1B
2010	Lower Klamath NWR, CA - Sheepy Lake
2012	Malheur NWR, OR – Malheur Lake
2015	Don Edwards NWR, CA – Five islands

2.0 SCOPE OF ANALYSIS

The scope of analysis under NEPA will consider direct, indirect, and cumulative environmental factors occurring within the project footprint, and indirect effects that may occur later in time and/or further removed from the project footprint. Actions within the analysis include construction methods used to demolish and depose of the exiting floating island and replacement with a rock island, use of a temporary access road and staging area, culver replacement,

transportation of materials from source sites to the project site, future maintenance of the island, and monitoring of the tern colony. The geographical scope of analysis includes all areas within the project footprint at the Lower Klamath Refuge, and Corps-constructed tern islands in Oregon and the Columbia River Estuary which would have indirect effects.

3.0 PROPOSED ACTION

To accomplish the stated purpose and need, the Corps proposes to replace a floating island with a permanent version to maintain Caspian tern habitat within Sheepy Lake (also known as Unit 2). Constructed in 2010, the one acre floating island in Sheepy Lake has experienced a number of issues, including moving nesting substrate, buckling, ponding, unwanted vegetation growth, and complete failure (breakage) of the internal cable system in 2016 (Figure 3.1). The island was built of 0.8 acres of nesting habitat and 0.2 acres of vegetation modules designed to grow vegetation and lessen effects of wind on the nesting colonies. During the winter of 2016/2017 most of the exterior cables failed (broke) and vegetation modules have floated away from the main part of the island (see comparison photos Figures 3.2 and 3.3).

Figure 3.1 Photo of Sheepy Lake Floating Island in March 2017.

Figure 3.2 Photo of Sheepy Lake Floating Island in September 2016.

Figure 3.3 Photo of Sheepy Lake Floating Island in March 2017.

3.1 Habitat Construction: Sheepy Lake Rock Island

3.1.1 Demolition and Disposal of the Floating Island

The floating island must be removed in order to build a replacement rock island at the current location of the floating island. The cables that anchor the island in place would be removed and the island towed by boat to the nearby shore near the defined staging area. The island made of recycled plastic, foam, cables, carpet, flagstone and gravel would be dismantled and trucked to a commercial landfill. There are no hazardous materials associated with the floating island. The exact work area to dismantle the island would be the left up to the contractor but must be near the proposed staging area or along the temporary access road needed for construction of the proposed rock island. The staging area and temporary access road location is depicted in figure 3.4. Nesting substrate may be salvaged from the floating island and used for the top layer of nesting substrate on the new rock island. The amount salvageable is unknown but assumed to be at least three inches of the entire surface. These salvaged materials may be stockpiled on the designated staging area until placed on top of the new rock island.

Figure 3.4 Location of proposed access route, staging area, temporary road and island location.

3.1.2 Habitat Construction: Sheepy Lake Rock Island

Island Design. Twelve of the thirteen islands built by the Corps for Caspian terns were built with dirt/rock core surrounded by rip rap and gravel nesting substrate. The rock designed island have proven very successful in use by terns and other colonial nesting birds, but more importantly, the rock island design provides consistent island integrity and low operation and maintenance costs. The proposed Caspian tern island would be located in at or very close to the location of the current floating island in the south central portion of Sheepy Lake. This location is approximately 2000 feet from the western edge of the lake. (Figure 3.4). The normal water level operating range for Sheepy Lake is between elevation 4079.01 feet and 4079.89 feet National Geodetic Vertical Datum 29 (NGVD29; all elevations in this SEA are in NGVD29).

On May 24, 2017, the lakebed probing was performed near the island location and in the area of the proposed temporary road access route. The water level at the time of probing was an average of 2.6 feet and there was 3.1 feet of very soft mud on top of a firmer lakebed layer. The lakebed at the proposed island location has an average substrate elevation of approximately 4073 feet with the mud layer at 4076 feet. The proposed island would be constructed to elevation 4083.15 feet (NGVD29) or approximately 9.6 feet above the approximate substrate elevation at the island location. This surface height would keep the island surface 3 feet above normal full pool elevation (4079.89 feet NGVD29). The 3 feet of freeboard would protect against an estimated maximum wave height of 2.5 feet, preventing over wash of the bird colony.

The basal area of the island would be built to support side slopes of 5-feet horizontal to 1-foot vertical (5H:1V). This ratio is gentle enough to facilitate easy access to the water's edge for juvenile nesting birds and other wildlife. Approximately 4,700 cubic yards of rip rap would be used for shoreline protection. Rip rap material would be obtained from local commercial sources. A grout material would be placed in six areas of the rip rap which would gaps in the rip rap allowing easy egress and ingress from the island to the water. The proposed island would be topped with 12 inches of nesting substrate composed of clean rock, gravel and sand 3/8" and less, with less than 10% fines, and light in color. The loose, granular substrate is preferred by colony nesting Caspian terns, as well as other ground nesting birds, and discourages accumulation of organics and vegetation growth.

The proposed island would be ellipsoid-shaped with nesting surface dimensions of approximately 300 feet by 152 feet (0.80 acres) at the crest excluding revetment; the base dimension is approximately 389 feet by 241 feet (1.73 acres), including the rip rap that would be placed around the perimeter of the island. The island will be similar in design to the Crump lake Island built in Lake County Oregon in 2008 (Figure 3.5). The island size may increase to 1.0 acre depending on the available funds. Ideally, the island area would be increased to accommodate more space for colonial nesting birds because the current floating island usually fills to capacity by a variety of birds including terns.

The major axis would be aligned parallel to the direction of prevailing winds to minimize the shoreline area exposed to direct wind-wave and ice action. Core material (island fill) would utilize approximately 17,900 cubic yards of quarry waste rock obtained from local commercial quarry sources. Caspian tern nesting substrate consisting of a one-foot layer (~1,400 cubic yards)

of small-diameter gravel and sand would be placed over the surface of the island. Nesting substrate material would be obtained from a local commercial source or a combination of salvaged material from the floating island and commercial sources. If the island size increased to 1.0 acres, the quantities for the island would be 21,300 cubic yards of core material, 1,800 cubic yards of nesting substrate and 5,200 cubic yards of rip rap. The general shape and island height would remain the same.

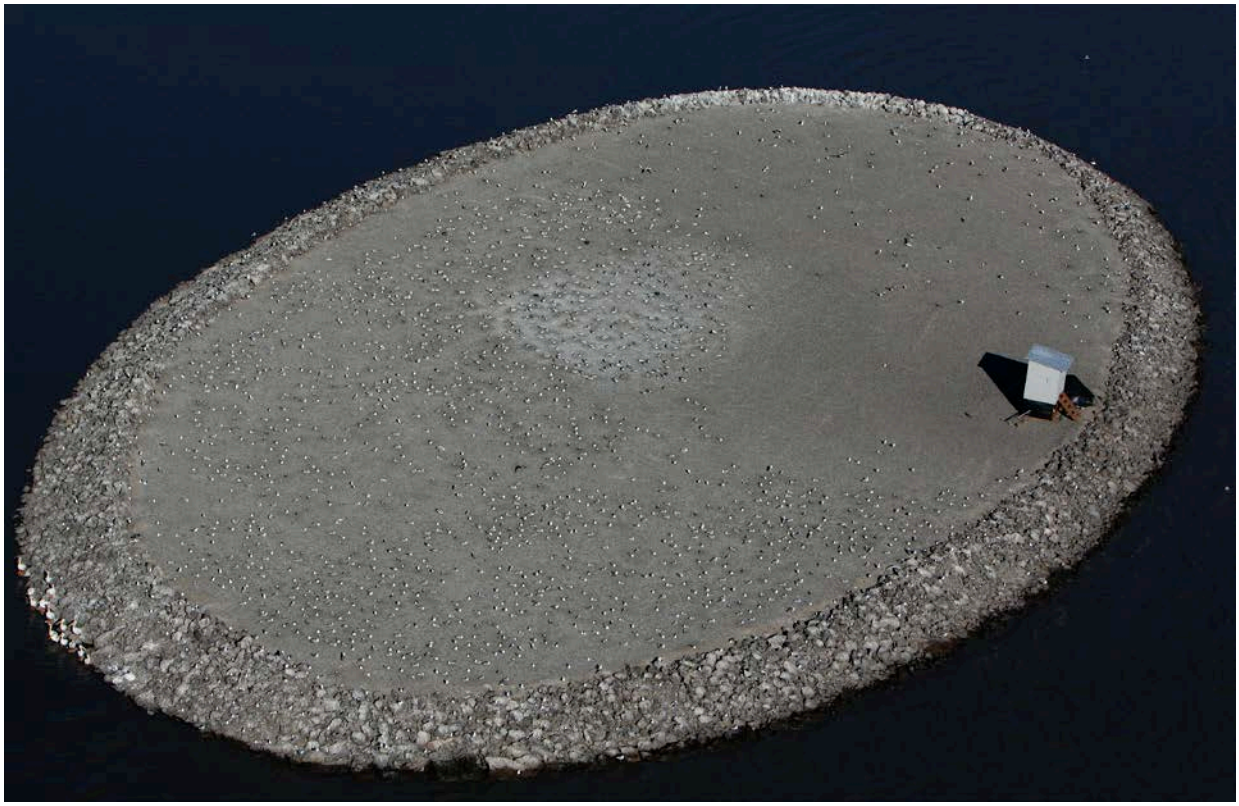


Figure 3.5 Crump Lake Island constructed in 2008 in Lake County, Oregon.

3.1.3 Timing of Construction. The construction of the rock island is proposed to occur from September 2017 to the end of March 2018. Water in Sheepy Lake would be managed to the lowest level possible during construction but would contain one to three feet of water. The full construction period is expected to be eight to ten weeks.

3.1.4 Construction Methods. Rock fill, rip rap and surface substrate suitable for Caspian tern and other colonial bird nesting use would be hauled to and placed on the Sheepy Lake rock island site by conventional and/or off-road dump trucks. A dozer would be used to push the island core material into the designed, survey marked, island shape and to compact the material. Fabric would underlie the rip rap protecting the island shoreline to minimize wave erosion of core material. Rip rap would be placed around the island perimeter using a trackhoe. The island surface material would be placed atop the core material. An excavator and dump truck will likely be used to remove the temporary access road. Eight, 4 feet x 6 feet shade structures would be built on the top of the island nesting substrate and scattered randomly on the island. This would provide shade for birds on hot days. These structures have been successful at other Corps-constructed islands in Oregon and at Tule Lake Sump 1b.

3.1.5 Access. Access to Sheepy Lake would be obtained via the Lower Klamath Refuge road system starting from Stateline Road, south on the "Eagle Road" which runs along the east side of Sheepy Lake for three miles to the entrance of the Sheepy West Wildlife Restoration Unit (Sheepy West). Four miles of the Sheepy West unit road would be used to access the Ford Field. Ford Field is a 130 acre grass pasture leased for grass harvest and cattle grazing. The field would be used to access the proposed temporary staging area which would be located approximately 0.6 miles from the south boundary road of the Sheep West Unit. Two small ditches would be temporarily filled to provide a smooth road condition. These ditches typically do not run water so no culverts are proposed at these locations. In total, 7.2 miles of Lower Klamath Refuge road and field would be used for delivery of materials and equipment for island construction that is planned to be trucked from commercial quarries sources. Rock would be added to soft portions of the roads and around the ditch crossings and two existing cattle guards. On some areas of roads grading would take place and rock used to improve soft areas. The rock placed on roads would be permanently left in place. Turn outs along the road may be constructed to provide passing of truck on the narrow 10-12ft wide roads. Turn outs would be placed every half to three quarters of a mile. These turn outs would made of rock materials and could be left in place or removed depending on the location and the needs of the Lower Klamath Refuge.

3.1.6 Staging Area. The proposed staging area would be four acres of grass pasture located in the north portion of the Ford Field and is fully on lands administers by the Lower Klamath Refuge. The area is fenced and annually used for harvesting pasture grass hay and short term cattle grazing. The temporary staging area would be used for storing materials and equipment during construction of the temporary access road and the new island. Size of the staging area would depend on the contractors need during construction but would be no larger than four acres. It is anticipated that the area needed for staging would be proof rolled with a water truck or loaded truck to delineate wet and /or soft areas. Soft areas may be covered with geotextile/geogrid and crushed rock to improve stability of the staging area. The proposed staging area allow for the closest access point to the proposed island location, which lessens the amount of temporary access road construction to the proposed rock island location. The staging area would be fully removed following construction of the island and removal of the temporary access road. Two locations have been identified and approved for disposal by the Lower Klamath Refuge including; the Lower Klamath Refuge maintenance station located along Stateline Road and the Orems Pit located 7 miles east of Sheepy Lake. The material would be stockpiles and made available for future Refuge needs. More materials may be used to make final repair to the Refuge roads following construction of the island.

3.1.7 Temporary Access Road. Starting from the staging area, a 1900 foot temporary access road would be required to haul materials and equipment to the island construction site. The road surface would be built 15 feet-wide and 1 foot above the waterline. The lake elevation would be maintained at a near-constant elevation for the duration of construction, reducing the possibility that the access road would be flooded and potential construction delay. The access road would be up to 30 feet-wide at the base and could consist of a several layers of geogrid or geotextile fabric on the ground and between rock placement until the entire road is one-foot above the water surface. An estimated maximum of 14,000 cubic yards of rock and/or quarry waste would be needed for the construction of the temporary road. Rock/quarry waste would

likely be obtained from local commercial quarry sources. The rock road is expect to displace the mud bottom layer and lie firmly on the hardpan lake bottom. Following construction of the island, the temporary access road would be removed and material disposed at one or more locations identified for disposal on the Lower Klamath Refuge.

3.1.8 Maintenance Methods. The principal maintenance requirement for the proposed island would be annual vegetation removal and prevention. Vegetation management can be attained via pulling, hoeing and/or application of an appropriate herbicide to remove and/or kill vegetation on the site. The timeframe for vegetation management would be just prior to the arrival of colonial birds expected to nest on the island. For Caspian terns, annual vegetation management would occur in late March – early April. Earlier treatment may be required if an earlier nesting colonial bird species also occupies the island. Access to the island would be by airboat or shallow-draft small boat. The Lower Klamath Refuge would handle vegetation management on the island, possess airboats equipped with spray equipment that can access the island. These boats can transport personnel, equipment and any necessary supplies to the island.

Large-scale maintenance could entail repair and replacement of rip rap; the addition of island core material and nesting substrate material is not anticipated. The perimeter revetment should prevent wave erosion, particularly since Sheepy Lake is a shallow body of water, and thus wave size is limited and the lake is not affected by currents. Additional rip rap would be placed on the windward side to provide additional protection. The nesting substrate (small-diameter crushed rock) would not erode in the wind due to its large size and interlocking angular surfaces. In the event of heavy rainfall, the level surface of the islands coupled with the size of the surface rock would preclude erosion from surface runoff. Rain should percolate through the surface rock and base material rather than run over the surface as it would on a sloped ground surface.

Should large-scale maintenance be required, the methods employed would be comparable to island construction, with construction of a temporary access road using geo-fabric, geogrid and rock would have to be established. Eroded areas would be repaired as necessary plus that amount necessary to prevent future reoccurrence. Upon completion of repair efforts, the access road would be removed and the road material would be placed in the refuge quarry.

3.1.9 Summary of Fill Requirements and Footprint. Table 3.1 below summarizes the fill requirements (in cubic yards) and footprint (in acres and/or linear feet) of in-water work for island construction at Sheepy Lake. Maintenance requirements are negligible; see maintenance methods for an explanation of revetment and anti-erosion efforts.

Table 3.1 Sheepy Lake Rock Island Fill (cubic yards) Requirements and Footprint (in acres/linear feet)

Island Fill Material	Nesting Substrate	Revetment	Access Road	Other	Footprint
17,900 0.8 acre	1,400	4,700	14,000 (road to island site) 20 (ditch crossings) 1625 (road to staging) 1000 (staging area)	Grout 110 cubic yards	1.73 acres 1900 linear feet (access road)
21,300 1.0 acre	1,800	5,200	Same as above	Same as above	2.0 acres
Total Fill at 0.8 acre: 40,755					
Total Fill at 1.0 acre: 45,055					

3.1.10 Post-Construction Monitoring

The new island would be monitored during the nesting season following construction to determine its use by Caspian terns and other nesting birds. At a minimum, the Corps would contract multiple aerial flights to collect photographs and use the photos to count species present, total number of birds of each species, number of nesting birds, and distribution of the birds. Future years monitoring would be the responsibly of the USFWS and could be conducted by boat or by air.

4.0 ALTERNATIVES

4.1 No Action Alternative

The No Action Alternative assumes that the Sheepy Lake floating island would not be removed, repaired, or replaced with a permanent island. The island would be left in its current location. During the winter of 2016-2017 perimeter cables that secured the vegetation module to the "mothership" broke and vegetation modules have now floated off to various portions of Sheepy Lake. In addition, all of the internal cables that hold the island together broke and now only one perimeter cable and two cross ropes are holding the island together. These cables now holding the island together would likely not be able to keep the island secured in placed through another winter. Under the No Action Alternative, the island would continue to degrade and likely separate into many pieces resulting in island modules floating off to various part of the lake. This alternative may lead to loss of habitat and therefore would no longer meet the purpose and need of the 2005 EIS and 2009 EA.

4.2 Repair the existing floating island (Rubber Membrane)

This alternative would involve detaching the island from its anchor system and towing the island to shore, off load the gravel, pressure wash the floats, apply and adhere a rubber membrane to hold the modules in place instead of the internal cable design of the original island. After the membrane is in place the gravel would be loaded back onto the surface and the island returned to its anchors and reattached. A staging and work area would need to be prepare to conduct the repair. This would occur via the same access routes of the proposed action but a large area of shoreline vegetation would need to be removed to allow the island to access the levy where a work area could be established. There is some risk associated with moving the island because the island could pull apart while in tow. This may cause addition damage the may or may not be repairable. There is additional uncertainly in the longevity of the other materials the island was built with and it is anticipated that future operations and maintenance (O&M) needs would be frequent and potentially costly when compared to a rock built structure similar to those already built by the Corps with high success and very low O&M costs. Reuse of the existing floating island would not require construction of a temporary access road into the lake, reducing potential adverse effects to water quality, sediment compaction and fish and wildlife use of the lake associated with construction and removal of the temporary roadway.

5.0 IMPACT ASSESSMENT

The potential impacts of the proposed action are assessed in relation to the No-Action Alternative and the Repair Alternative. They include considerations of the construction methods used to build the tern islands, the use of staging areas at the project site, the installation and removal of roads used to access the islands, and any transportation of material from the source sites to the project site. The existing conditions of the action area are described in the 2009 EA and are incorporated herein by reference.

Aquatics

Water Quality (temperature, salinity patterns and other parameters):
The proposed actions, construction of a temporary access road and an island within Sheepy Lake would result in minimal disturbance to sediments in the unit. A geotextile fabric would be placed over the temporary access road corridor and the island footprint prior to placement of rock to prevent pumping of sediments due to truck traffic. Some minor disturbance to the lakebed surface would be expected when the temporary access road is removed. Both construction and removal of the temporary access road would occur with 1 to 3 feet of water in the lake. The use of geotextile fabric and rock is necessary to maintain the integrity of the temporary road during construction. The exposed materials at the island location after construction would consist of native rock derived from local quarry sites. Material from the quarry sites do not pose a concern for contamination as they are native materials. Thus the proposed actions would not expect to impact water quality, temperature, salinity or other parameters.

No Action Alternative: If the floating island were to degrade into floating segments, there could be a localized change in water temperature in shoreline areas or vegetated areas where island modules get lodged into the shoreline.

There would be no expected change in water quality from the Repair Alternative.

Turbidity, suspended particulates:
Construction of the rock island at Sheepy Lake would be done when the water is low or drawn down, so there would be less turbidity concerns during construction. Post-construction, when lake is full, the likelihood of turbidity would be minimal because of the lake would be filled gradually over essentially a level surface thus precluding current erosion or erosion due to cutting when water fills depressions. The use of geotextile fabric and rip rap for shore protection at the island would minimize the potential for erosion of island fill material, thus negating turbidity and suspended particulates concerns at the island location and throughout the lake. Contract specifications for erosion and turbidity control are further evaluated and described in the Erosion and Accretion Patterns section below.

No Action Alternative: If the floating island were to degrade into floating segments, there could be a localized turbidity from nesting substrate entering the water when the island modules separate. This would a short term effect as the substrate would be expect to reach the bottom of the lake and remain in place.

There would be a small amount of turbidity expected from the Repair Alternative mainly at the shoreline where the repair activities would take place. These would be minimal impacts and short in duration.

Substrate:
Direct impacts to the substrate in Sheepy Lake would occur from construction activities. The principle impact would result from construction of the islands by covering substrate at the island location with rock and borrow material. The island construction impact would be approximately 1.7 acres in extent at the base. This a small percentage of lakebed loss considering the 430 acre lake size. The impact of the access roads would extend 1900 linear feet by up to 30 feet wide within the lake and would only be temporary in nature. The temporary access road would be removed upon completion of the island. Compaction associated with the temporary access road is anticipated but would be limited to the footprint and should lessen over time with subsequent inundation.

No Action Alternative: If the floating island were to degrade into floating segments, there could be a localized loss of nesting substrate entering the water. This would a short term effect as only small amounts of the substrate would be expect to reach the bottom of the lake.

Under the Repair Alternative, substrate impacts would occur in a localized areas (less than one acre) along the shoreline of Sheepy Lake. These impacts would be temporary in nature and would expect to recover quickly to its nature condition.

Currents, circulation or drainage patterns:
Sheepy Lake receive its water from return flow irrigation from the Klamath River. Water levels within the lakes have been stabilized to prevent flooding of adjacent lands. The lake is hydrologically connected to other managed wetland units through gates and canals and is managed as a year-round water body (USGS 2006). Impacts to the drainage system are expected

to be insignificant due to very small ratio of island size (1.7 acres at the base) to water body size (430 acres). The construction of the island would have insignificant impacts on currents or circulation.

No Action Alternative: If the floating island does not contribute to circulation patterns, nor would it cause affects if the island were to become non-functional or separate in pieces.

Under the Repair Alternative, no affects to circulation would be expected.

Flood control functions:
The island would have no impact to flood control storage since the island would be only 1.7 acres within the 430 lake and there are no proposed changes to the existing levy system and water control devices in Sheepy Lake.

There would be no affect to flood control functions due to the No Action Alternative or the Repair Alternative.

Storm, wave and erosion buffers:
The rock island design encapsulates fine rock materials within a fabric layer and protected by rip rap. This island design protects the island from erosion. Since the island would be located in the middle of Sheepy Lake, and not near vegetated area, there would be no impact on storm, wave or erosion buffers within the Lake.

There would be no affect to storm, wave and erosion buffers from the No Action Alternative or the Repair Alternative.

Erosion and accretion patterns:
Throughout all phases of project construction, methods and equipment would be utilized to ensure erosion and turbidity is minimized. The contractor would be required to develop a rigorous Erosion and Sediment Control Plan for review and approval of the Corps. This plan will identify the most appropriate type and location of erosion and sediment control measures, and the specific best management practices (BMPs) which would prevent sediment and any other project-generated pollutants from entering streams or water bodies. The plan must comply with the requirements of the Corps' NPDES permit. Possible controls and BMPs include, but are not limited to:

- Runoff Control BMP
- Erosion Prevention BMP
- Preservation of existing vegetation
- Vehicle and equipment cleaning
- Vehicle and equipment fueling, maintenance and storage
- Material delivery and storage controls and stockpile management

It is anticipated that little-to-no excavation would be involved with this work, greatly reducing disturbance and dispersal of native sediments and pollution sources. Placement of island material would carry the potential to disturb lakebed sediments. Island construction includes laying a combination of geogrid material as well as geo-synthetic fabric along the lakebed before placing

base rock and eventually island core material. The geogrid/geo-synthetic fabric combination will assist in minimizing the extent to which lakebed sediments are disturbed during construction. In an effort to minimize the effect of erosion and pollution caused by island construction activities, which will be detailed in the Erosion and Sediment Control Plan developed by the Contractor, controls and BMPs will be employed including, but not limited to, in-stream isolation techniques such as:

- Installation of geotextiles, silt barriers or curtains
- Installation of portable dams

Disturbances to the existing road, due to improvement activities, resulting in releases of sediment (turbidity, TSS, etc) to Sheepy Lake not anticipated. All material used for road improvements is required to be relatively clean, containing less than 10 percent fines passing a #200 sieve. This would result in minimal-to-no surface erosion or dispersal of sediments into Sheepy Lake. As discussed above, frozen ground conditions, high lake volume and high river flows are anticipated to partially mitigate for any possible construction-related dispersal to the lake. Furthermore, the shoreline area is surrounded by dense bulrush vegetation which will serve to isolate disturbances and turbidity caused by construction activity. The Erosion and Sediment Control Plan, developed by the Contractor, would be required to identify control measures and BMPs to be employed in the event that erosion and sediment dispersal are greater than anticipated. These measures include, but are not limited to:

- Sand bag barriers and gravel bag berms (out of water areas)
- Straw bale dikes (out of water areas)
- Fiber rolls/wattles (out of water areas)

Additionally, all equipment entering the Lower Klamath Refuge would require a containment station and would be subject to standard washing procedures to control for biologic contaminants. Fuel, lubricants and oil would be managed and stored in accordance with all Federal, State, regional and local laws and regulations. Used lubricants and oils to be discarded will be stored in marked corrosion-resistant containers and recycled or disposed in accordance with 40 CFR §279, State, and local laws and regulations. All equipment would be inspected daily for hydraulic and engine oil leaks; leaking equipment will be repaired prior to returning to service. Soil and rock contaminated by leaking oil/fuel will be excavated, stored and disposed of at an approved facility.

Post construction erosion, sediment dispersal and water quality issues are also of concern. As discussed, it is anticipated that by improving the current road conditions, long term effects of erosion and sediment dispersal would decrease. In dry conditions, the road improvements would decrease the generation of dust and fine soils and sediment particles that can be transported to waterways by wind. Construction of the habitat island necessitates placement of large quantities of rock and fill into Sheepy Lake. To address long term erosion and dispersal of fines from the island fill into the lake, island construction includes a geo-synthetic fabric.

There would be no affect to erosion and accretion patters from the No Action Alternative. The Repair Alternative would follow the same conditions as the proposed actions.

Water supplies, conservation:
The primary water supply to the Lower Klamath Refuge is from the Klamath River through the "ADY Canal" draining into Sheepy Lake. Sheepy Lake is considered a year round water body

but incoming water is diverted to adjacent managed wetland units to promote wetland vegetation and provide habitat for waterfowl and other wildlife. The proposed action is to locate the rock island in the deeper portion of the lake which would provide habitat for colony nesting birds even during drought years similar to 2014 and 2015. In those years, Sheepy Lake was nearly void of water but not until late August and after or near the end of the brooding period for terns and other nesting birds that were utilizing Sheepy Lake Floating Island. The proposed island is located several miles to the south of ADY Canal and would not affect water supply. There would be no construction near the water supply into Sheepy Lake or near outlets of the lake.

Under the No Action Alternative, there would likely be no effect to the water supply but island modules that are loosely floating around the lake could block canal outlets and slow water supply to adjoining wetland units. Removal of the lose floating island modules would be necessary to prevent blockage at the water outlets.

Under the Repair Alternative, the effects are the same as the proposed action.

Geomorphology:
Historically, Sheepy Lake wetlands fluctuated greatly from year to year depending on regional precipitation. These fluctuations would have resulted in the formation of islands; the number, size and location of islands would have been dependent upon the annual water level attained. Currently, Sheepy Lake is an impoundment with relatively stable water levels and even bottom surface gradient and lacks island habitat. The proposed action would slightly alter Sheepy Lake's current geomorphology through creation of a permanent island.

There would be no affect to geomorphology from the No Action Alternative or the Repair Alternative.

Vegetation:
Minimal vegetation impacts are associated with construction of the temporary access road, temporary staging area, and rock island in Sheepy Lake. The impact to upland/wetland vegetation may occur from road construction actions at the wetland/upland interface. This impact would occur from grading, leveling and subsequent removal of the temporary access road. This is similar to the interface at Tule Lake when a similar temporary road was built to access that island build, where the shoreline vegetation recovered quickly post-construction and did not require planting.

A minor and temporary impact to upland/wetland vegetation may occur from establishment of a road crossing at two drainage ditches on the access road. This impact would occur from added rock fill needed to provide access into Ford Field. Ford Field is a grass field that would be harvested for hay under normal Refuge operations prior to construction. The temporary road across Ford Field would impact vegetation during the non-growing season and is expected to recover fully during the next growing season March through July. The site is expected to naturally revegetate with pasture grasses that currently grow in the field.

Under the No Action Alternative, as modules separate and float away into the shoreline. Vegetation would be expected to grow on the island and could become permanently lodged into the shoreline vegetation. The impact would be minimal.

The Repair Alternative would only have localized impacts on shoreline vegetation where the repair would take place. This would be temporary in nature and vegetation would recovery naturally and quickly following construction.

Fish:
Trap net sampling conducted in the summer and late fall of 2007 (Hodge and Buettner 2008), in Tule Lake Sump 1A captured 3,453 Sacramento perch, 1,499 tui chubs, 831 blue chubs, 130 brown bullhead, 16 goldfish, 15 fathead minnows, 4 yellow perch, and 2 Lost River suckers (540 trap hours). Fish captured from Tule Lake Sump 1B included 5,717 tui chubs, 1,197 Sacramento perch, 126 blue chubs, 5 goldfish, 3 yellow perch, and 2 brown bullheads (440 trap hours). A total of 13,000 fish for both sumps combined were captured of which two were Lost River suckers (0.015%), which are described in greater detail below. Caspian terns, American white pelicans, gulls and other fish eating birds are already present on Sheepy Lake or are within commuting range of other locales that they frequent. Sheepy Lake is a permanent body of water but experience significant fish loss during drought years (2014 and 2015). Fish species composition is anticipated to be generally comparable to that observed for Tule Lake Sumps 1A and 1B, but may take many years for fish to repopulate to pre-drought numbers. There would be no change in composition of fish eating birds and their potential impact to fish due to proposed actions. Impacts would be comparable to the current consumption of terns using the Sheepy Lake floating island.

Under the No Action Alternative, it would be expected that floating island would degrade and become non-functional to colony nesting birds. This would result in no nesting colonies and no fish consumption related to the nesting birds at Sheepy Lake. Terns and other colony nesting bird species would have to seek habitat outside of the area and could have impacts on fisheries in those locations.

There would be no change in fisheries or fish consumption due to the Repair Alternative for it would remain the same as its current rate.

Wildlife:
The open water habitat that characterizes the proposed island location is utilized by many species of waterfowl and waterbirds, such as American white pelican, Snow, Ross', white-fronted, and Canada geese, pintail, mallard, gadwall, canvasback, Western & eared grebes, and black tern amongst others. Adjacent expanses of tule marsh support tri-colored blackbirds, white-faced ibis, herons and egrets for nesting and foraging activities. Raptors such as peregrine falcons, bald eagles, northern harriers, and red-tailed hawks are common in the area due to the abundance of prey species and carrion.
The proposed island would be constructed in part during fall migration of waterfowl. Temporary displacement waterfowl would occur during construction but mainly limited to the relatively small construction area. The new habitat would be a permanent source of quality nesting habitat for terns and other colony nesting birds. This is important to the entire network of tern nesting

habitat constructed by the Corps. Maintaining 0.8 acres of habitat at Sheepy Lakes allows the Corps to also maintain habitat and East Sand Island at 1.0 acres. Currently, the floating island support a large number of nesting birds and competition for space has been observed where at times Caspian terns may have a difficult finding adequate space for nesting. If the optional construction acreage of 0.2 acres is built at Sheepy Lake, there could be less competition for space freeing up the ability for terns to expand in number on the island. No further reduction of habitat at East Sand Island would be proposed due the expansion of habitat at Sheepy Lake. The additional habitat would be only be created to provide more space for the large numbers of birds using the island.

Under the No Action Alternative, there would be a loss of habitat for colony nesting birds that has been present since the floating island was built in 2010. A large number of bird species that use the island would be displaced including but not limited to pelicans, gulls, waterfowl, terns and cormorants. In addition, the loss of habitat for terns would be expected since the Sheepy Lake Island has been used by an average of nearly 300 nesting pairs of terns annually since 2010. The habitat is important for the Corps' ability to maintain 1.0 acres of habitat at East Sand Island.

Under the Repair Alternative, there would likely be no changed in the current use and the Corps would maintain 1.0 acres of habitat at East Sand Island.

Special aquatic sites (wetlands, mudflats, sanctuaries and refuges, other):
Sheepy Lake qualifies as a special aquatic site due to the presence of wetlands and shallow waters and its inclusion in a National Wildlife Refuge. The proposed activity would entail filling approximately up to 2.0 acres of the 430 acres comprising the lake. Construction of this nesting island would improve wildlife use in lake through continuing to provide secure nesting habitat for colonial nesting birds. Historically, the lake and the surrounding area provided nesting islands for colonial nesting bird species. Drainage and habitat alteration for agricultural purposes has eliminated secure nesting habitat islands from the mix of habitats. The proposed action would partially restore that element to the wetlands habitat complexity and within the confines of the refuge, thus ensuring a nesting sanctuary for colonial nesting birds.

Under the No Action Alternative, there would be a loss of habitat for colony nesting birds that has been present since the floating island was built in 2010. The loss of habitat for terns would be expected since the Sheepy Lake Island has been used by an average of nearly 300 nesting pairs of terns annually since 2010. The habitat is important for the Corps' ability to maintain 1.0 acres of habitat at East Sand Island.

Under the Repair Alternative, there would likely be no changed in the current use and the Corps would maintain 1.0 acres of habitat at East Sand Island.

<u>Terrestrial Habitat</u>

Geomorphology:
Historically, Sheepy Lake wetlands fluctuated greatly from year to year depending on regional precipitation. These fluctuations would have resulted in the formation of islands; the number,

size and location of islands would have been dependent upon the annual water level attained. Currently, Sheepy Lake is an impoundment with relatively stable water levels and even bottom surface gradient and lacks island habitat. The proposed action would only temporarily affect shoreline geomorphology through creation of a temporary staging area and temporary access road. All rock material would be obtained from a commercial quarry and these materials would be removed following construction of the island.

Under the No Action Alternative, there would be no impacts to terrestrial habitat geomorphology.

Under the Repair Alternative, impacts would be similar to the proposed action.

Vegetation:
The only impact to vegetation would occur from a temporary access road across private pastureland and USFWS uplands, plus some impacts to vegetation on the dike that abuts Sheepy Lake. These temporary road routes would not be re-seeded or planted because plants are expected to recover quickly at the site.

Under the No Action Alternative, there would be no impacts to vegetation except where floating island modules would lodge in vegetation areas.

Under the Repair Alternative, impacts would be similar to the proposed action.

Organisms:
Construction and implementation of the nesting areas will benefit Caspian terns and other colonial nesting species such as American white pelicans that occur in the by providing suitable nesting habitat. Wildlife resources using the refuges are not anticipated to be adversely impacted by the construction action. There will be a loss of up to 2.0 acres of soft sediment habitat for small benthic animals, but there will added structure in the lake for those species that can take advantage of rock structure.

The proposed action is not anticipated to result in additional disturbance at a level of concern. Habitat impacts are minimal and would not be expected to adversely affect terrestrial wildlife and would be temporary while during construction. There would be temporary disturbance to waterfowl using Sheepy Lake during fall migration. Many of the reptiles and small mammals near the staging area would be temporarily displaced during construction but overall animals associated with terrestrial habitats are expected to be negligible.

Species Listed as Endangered or Threatened under the Endangered Species Act:
The Shortnose (*Chasmistes brevirostris*) sucker and Lost River sucker (*Deltistes luxatus*) are federally-listed endangered species. Impacts to these species were addressed through submission of a Biological Evaluation and issuance of a Biological Opinion (BO) during the consultation process in 2009. There are no ESA-listed suckers in Sheepy Lake and therefore there would be no direct impacts from the construction of a rock island. Potential impacts from indirect effects of terns using the island was consulted on in 2009 and that consultation will not differ due to the proposed project. To document that impacts would not differ from the 2009 BO,

the Lower Klamath Refuge is re-initiating consultation. A letter exchange with the Service or a review BO is expected to be complete before issuance of a FONSI related to the proposed action.

Under the No Action Alternative, there would likely be a loss of habitat and therefore a BO would no longer be valid.

Under the Repair Alternative, impacts would be the same as the 2009 BO and no consultation would be required.

Air Quality:
In coordination with the Siskiyou Air Quality Control Board, it has been determined that the proposed action does not require a Clean Air Act conformity analysis based on the limited emissions associated with the activities. Conservation recommendations, such as dust abatement, would be utilized during construction to reduce travel distances of air particles especially on the main access roads.

Under the No Action Alternative, there would be no impacts to air quality.

Under the Repair Alternative, impacts would be similar to the proposed action.

Geology and Soils:
A discussion on direct impacts to soils within the management units can be found in the for aquatic substrate section above. The local quarry sites have already been opened and borrow operations would remain within the previously disturbed footprint, thus impacts to the soil there have already occurred. Other than the minor construction impacts identified, no significant impacts to soils are expected.

Under the No Action Alternative, there would be no impacts to geology or soils.

Under the Repair Alternative, impacts would be similar to the proposed action.

Noise:
The proposed actions will take place from approximately 7:00 am to 5:00 pm Monday through Saturday. The proposed island sites are remote and have no immediate local residences. The project staging area would be approximately one mile from the nearest residence. Most of the noise associated with the proposed action would be from trucks on roads and large equipment at the staging and island locations.

Under the No Action Alternative, there would be no impacts to noise.

Under the Repair Alternative, impacts would be similar to the proposed action.

Recreation (boating, fisheries, other):
The proposed action would have short term impacts to refuge visitors. The three mile segment of the “Eagle Road” and three mile section of the Sheepy West Unit roads would be temporarily closed during construction. The Sheepy West Unit is normally used by waterfowl hunters during

the proposed construction period, but very few hunters use this area. The main access and use of the Lower Klamath Refuge for hunting and viewing is further east of the Sheepy Unit with two main arterial roads providing access and prime hunting opportunities. Fishing is not allowed on Sheepy Lake as well as boating. Refuge roads would be open to the public following completion of the island. Roads used during construction would left in better condition than prior to construction and therefore benefitting users of the area post construction.

Under the No Action Alternative, there would be no impacts to recreation.

Under the Repair Alternative, impacts would be similar to the proposed action.

Land use classification:
The proposed activities are consistent with several of Lower Klamath Refuge objectives, which include: (1) maintain habitat for endangered, threatened and sensitive species; (2) provide and enhance habitat for fall and spring migrant waterfowl; (3) protect native habitats and wildlife representative of the natural biological diversity of the Klamath Basin; (4) integrate the maintenance of productive wetland habitats and sustainable agriculture; (5) ensure that the refuge agricultural practices conform to the principles of integrated pest management; and (6) provide high quality wildlife-dependent visitor services. Objectives 2 and 3 are consistent with the intended effects of the proposed action.

Under the No Action Alternative, there would be no impacts to land use classification.

Under the Repair Alternative, impacts would be similar to the proposed action.

Transportation and traffic:
Construction traffic for hauling materials and supplies to this location would primarily occur on existing public roads. The proposed action would have short term impacts to refuge visitors. The three mile segment of the “Eagle Road” and three mile section of the Sheepy West Unit roads would be temporarily closed during construction. Refuge roads would be open to the public following completion of the island. Roads used during construction would left in better condition than prior to construction and therefore benefitting users of the area post construction.

Under the No Action Alternative, there would be no impacts to recreation.

Under the Repair Alternative, impacts would be similar to the proposed action.

Aesthetics/visual impact:
The location of the rock island is distant from any public roads and is also screened from view by tule marshes. The profile of the island will be very low on the water. There are no anticipated negative affects to visual or aesthetic values from the rock island.

Under the No Action Alternative, island modules would likely separate and disperse throughout the lake. The area is not visually accessible by public users of Sheepy Lake, but there would

likely be some negative visual impacts to Refuge personnel that frequently access the lake for management purposes.

Under the Repair Alternative, impacts would be similar to the proposed action.

Energy consumption or generation:
The proposed actions have been designed so that the construction consumes a minimal amount of energy. Fill material would be from the local area in order to reduce the amount of energy expended for transportation purposes. Post-construction, energy use is minimal and associated largely with O&M actions on an occasional basis.

Under the No Action Alternative, no energy or consumption would be expended.

Under the Repair Alternative, impacts would be similar to the proposed action.

Archaeological site:
The project has been designed to avoid impacts to archaeological sites and historic properties currently listed or determined eligible for listing on the National Register of Historic Places (NRHP). Pre-construction cultural resource background reviews and field inspections are being completed by the Corps of Engineers, in consultation with the USFWS, during the public review period of this SEA. Although there are no known sites or historic properties eligible for listing on the NRHP located within the proposed project footprint, the entire area of potential affect (APE) will undergo further evaluation and, if determined necessary, protective measures will be taken to avoid any locations that contain cultural resources or historic properties. The APE to be evaluated includes the proposed access roads and travel routes, staging areas and island construction locations. Upon completion of the pre-construction cultural resource background reviews and field inspections, a findings report with determinations of effect and recommendations will be submitted by the Corps to the USFWS for review, consideration and further consultation per National Historic Preservation Act (16 USC 470 and 36 CFR 800) regulations.

There would be no effects to NRHP under the No Action Alternative.

Under the Repair Alternative, impacts would be similar to the proposed action.

Socio-economic:
The proposed actions and the alternatives would not result in any foreseeable socio-economic significant impacts.

Environmental Justice:
The proposed action would not affect environmental justice. All work is being conducted within lands administered by the USFWS on the Lower Klamath Refuge. The area is very remote and it is approximately 20 miles to the nearest city.

There would be no effects under the No Action Alternative.

Under the Repair Alternative, impacts would be similar to the proposed action.

Growth inducing impacts (community growth, regional growth):
The proposed project would be conducted concurrently with other habitat enhancement projects at the refuge that may also attract more wildlife observers, so the independent Corps-proposed actions would not have a significant impact on community and regional growth.

Impacts would be similar to the proposed action for both alternatives.

Conflict with land use plans, policies or controls:
The proposed actions and the alternatives support the refuge objectives for land use policy, such as providing and enhancing habitat for fall and spring migrant waterfowl.

Irreversible changes, irretrievable commitment of resources:
The proposed island may be removed if necessary, but commitment of resources would be irretrievable. Staging areas and access roads are temporary fixtures. If the island were to be removed, operations at East Sand Island may be effected so that current management of one-acre of tern habitat would need to be re-valuated.

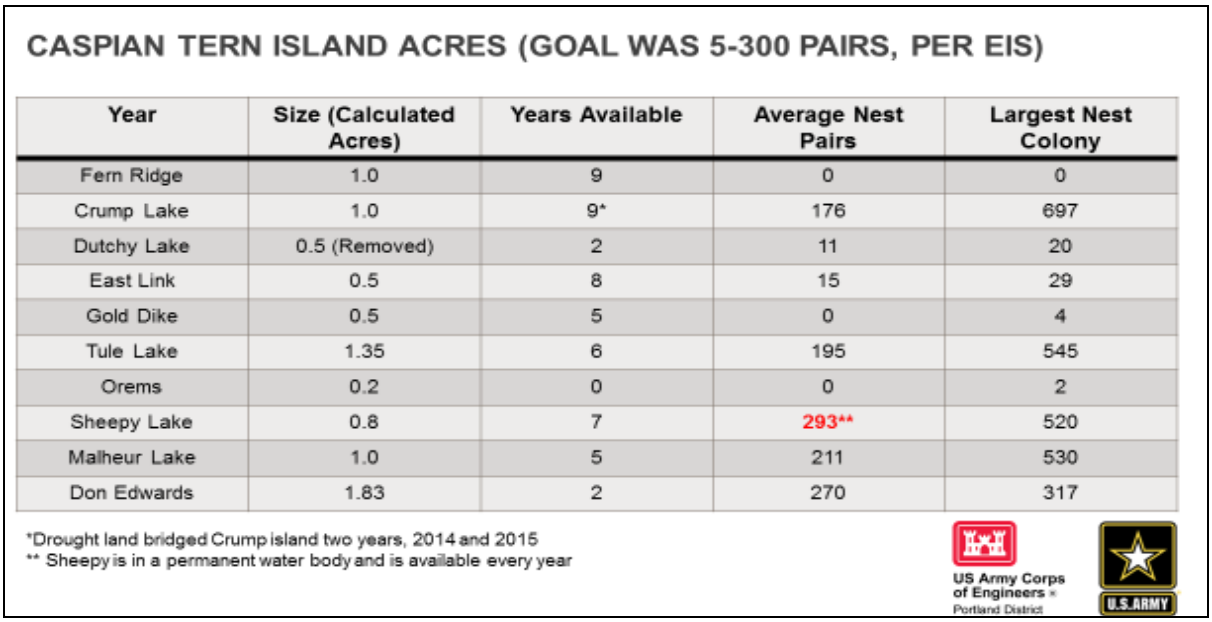
Under the NO Action Alternative, the island would likely deteriorate and resources would need to be committed to retrieve and dispose of the island. These resources would be irretrievable since the island would likely be disposed at the cost of the Government.

Under the Repair Alternative, impacts would be similar to the proposed action.

6.0 SUMMARY OF INDIRECT AND CUMMULATIVE EFFECTS

6.1 Indirect Effects

6.1.1 Caspian Terns. Based on the range of known nesting densities in the Columbia River Estuary, the tern colony on East Sand Island is expected to decrease to approximately 2,500 to 3,125 breeding pairs. In 2015, habitat was reduced to 1.0 acres following construction of habitat at Don Edwards National Wildlife Refuge in the South San Francisco Bay area. Terns displaced from East Sand Island from habitat reduction have been document at most nesting islands built by the Corps (Figure 6.1). Caspian terns use ephemeral habitats and thus are very adept at locating alternative nesting sites. The reduction of habitat at East Sand Island and development of alternative habitat elsewhere in the western region plays on the species mobility and adeptness in locating alternative nesting sites. However, other nesting sites in the region have not been observed to be as productive as the estuary. Thus, displaced terns have experienced an overall decrease in productivity compared to that observed on East Sand Island. Results of the use of Corps constructed islands built as a result of the Caspian Tern Plan have been mixed but overall very successful as depicted in figure 6.1.



CASPIAN TERN ISLAND ACRES (GOAL WAS 5-300 PAIRS, PER EIS)

Year	Size (Calculated Acres)	Years Available	Average Nest Pairs	Largest Nest Colony
Fern Ridge	1.0	9	0	0
Crump Lake	1.0	9*	176	697
Dutchy Lake	0.5 (Removed)	2	11	20
East Link	0.5	8	15	29
Gold Dike	0.5	5	0	4
Tule Lake	1.35	6	195	545
Orems	0.2	0	0	2
Sheepy Lake	0.8	7	293**	520
Malheur Lake	1.0	5	211	530
Don Edwards	1.83	2	270	317

*Drought land bridged Crump island two years, 2014 and 2015
** Sheepy is in a permanent water body and is available every year

Figure 6.1 Caspian tern nesting attendance at Corps constructed islands

Sheepy Lake is a highly used alternative nesting site and its location and use plays an important role to providing habitat in an area with limited habitat availability. Sheepy Island in conjunction with other Corps-constructed island provide a network of habitat opportunity where terns can nest at a variety of locations and base their use on the specific year forage fish availability, water levels, predation pressures as so on. The reduction at habitat at East Sand Island has reduced the tern breeding population and reduced predation on 13 ESA-listed stocks of salmonids. Maintaining habitat at East Sand Island would allow for continued successes of the Caspian Tern Management Plan.

6.1.2 Fishes. The reduction of habitat at East Sand Island has resulted in a decreased tern nesting colony, causing Caspian terns to seek new nesting habitat elsewhere. The reduction in numbers of terns breeding in the Columbia River Estuary has substantially reduced ESA-listed juvenile salmonids as well as overall fish consumption levels by Caspian terns. Consumption of various marine fishes in the estuary (e.g., northern anchovy, sardines, herring, and smelt) have been reduced with implementation of the EIS and 2009 EA. Regional fish populations have been impacted by drought in recent years, but occur in high enough numbers for terns and other fish easting birds to find forage fish resources near Corps-constructed islands to maintain some level of use. Although lower tern attendance occurred in areas where drought was severe, these are expected results and the cycle of high water years and low water years will influence the fish presence and corresponding tern use. Klamath Basin is one region where there is consistent water and fish resources for terns and other birds, providing the consistent use seen since the construction of the Sheepy Lake Island in 2009.

6.1.3 Species Listed as Endangered and Threatened under the Endangered Species Act. Based on the NMFS report (NMFS 2004; USFWS 2005), population growth rate increases for four steelhead ESUs could occur within one generation (4 to 5 years). The East Sand Island tern habitat was gradually reduced over time to its minimum of one acre in the spring of 2015.

Benefits to ESA-listed salmonids were detected as early as 2014 but has improved more each year following the full reduction of set forth in the Caspian Tern Plan. Although the Caspian tern colony is still above management goals, the predation rates on salmonids has dropped to near management goals, thus the need for keeping the alternative nesting habitat available for terns outside the Columbia River Estuary.

6.2 Cumulative Effects

Tule Lake and Lower Klamath refuges under Executive Order have been managed "as a preserve and breeding ground for wild birds and animals" since 1928. On-going USFWS management activities include: (1) extensive wetland/cropland rotation scheme; (2) implementation of a comprehensive Integrated Pest Management Program on commercial lease lands; and (3) maintenance of an extensive water conveyance infrastructure. Due to the large scale of habitat and agricultural management activities that have occurred over several decades on the refuges, the proposed activities would have a negligible impact on the physical and biological environment based on the scope of cumulative impacts. The Corps has consulted with the USFWS and any reasonably foreseeable USFWS management or permitting activities are understood as having a negligible impact when assessed cumulatively with the Corps' proposed action. Further, it appears that any reasonably foreseeable state or private activities in the action area at Lower Klamath Refuge would have a negligible impact when assessed cumulatively with the Corps' proposed action.

7.0 ENVIRONMENTAL COMPLIANCE

Statute	Status of Compliance
National Environmental Policy Act (NEPA) of 1969 (42 USC 4341 *et seq*) Council on Environmental Quality Regulations for Implementing the Procedural Provisions of the NEPA (40 CFR 1500-1508) dated July 1986	This SEA has been prepared for continuing compliance with NEPA and is tiered from the over-arching FEIS (USFWS 2005) and ROD (USACE 2006). All agency and public comments will be considered and evaluated. If appropriate, a FONSI will be signed with a conclusion of no significant impacts which would complete compliance with NEPA.
Clean Air Act (42 USC 7401 *et seq*)	In coordination with the Siskiyou Air Quality Control Board, it has been determined that the proposed action does not require a Clean Air Act conformity analysis based on the limited emissions associated with the activities. Conservation recommendations, such as dust abatement, will be utilized during the activity.
Clean Water Act of 1972 (33 USC 1251 *et seq*) Rivers and Harbors Act of 1899 (33 USC 403) Executive Order 11990, Protection of Wetlands, (42 FR 26961, 1977)	A Notice of Intent to Comply with the Terms of the General Water Quality Certification Order for Small Habitat Restoration Projects is being filed with the North Coast California regional Water Quality Control Board during the public comment period of this SEA.. This document serves as compliance of the 404(b)(1) Alternatives Analysis. Compliance with RHA is accomplished by this SEA. The proposed action would occur within a 430 acres of managed wetland. The action, which would restore natural geomorphic characteristics to the wetlands, would impact approximately 1.3 acres. The ratio of impacted wetlands to the size of the total wetlands is minimal.
National Oceanic and Atmospheric Administration Federal Consistency Regulation (15 CFR 930) Coastal Zone Management Act of 1972, 16 USC 1451 *et seq* California Coastal Act of 1976	N/A Project does not occur within coastal zone jurisdiction. N/A N/A
Endangered Species Act of 1973 (16 USC 1531, as amended)	A Biological Evaluation is currently being completed by the Lower Klamath Refuge to be submitted to the USFWS by the end of June 2017; the effects determination is that the proposed actions may affect, but is not likely to adversely affect species/adversely modify critical habitat for Short Nose and Lost River Suckers. The USFWS is expected to provide a updated BO for the project prior to completing a FONSI.

Fish and Wildlife Coordination Act (16 USC 661-666c)	The proposed action has been coordinated with the USFWS in compliance with this Act. The USFWS have been involved with project planning and will be in charge of future maintenance and monitoring activities.
Magnuson-Stevens Fishery Conservation and Management Act Fishery Conservation Amendments of 1996, (16 USC 1801 *et seq*) – Essential Fish Habitat (EFH)	There are no fish species covered by Fisheries Management Plans within the project action area. The Upper Klamath River Hydrologic Unit, which contains EFH for Chinook and coho salmon, terminates at the Iron Gate Dam, which is downstream of the project area.
Migratory Bird Treaty Act (16 USC 703-711)	This project will have a net benefit for migratory birds by maintaining a minimum of 0.8 acres of Caspian tern habitat for breeding and nesting.
National Historic Preservation Act (16 USC 470 and 36 CFR 800): Protection of Historic Properties	Pre-construction field and record cultural resource surveys was completed by the Corps and USFWS on June 22. 2017. Results, determinations of effect and recommendations will be submitted to the California State Historic Preservation Office and affected Tribes through the USFWS Programmatic Agreement Appendix B consultation process. The potential impact areas are not known to contain cultural resources that are potentially eligible, eligible or listed on the National Register of Historic Places. Additional archaeological surveys are being conducted to verify earlier records and field research findings.
Executive Order 11593: Protection and Enhancement of the Cultural Environment	See NHPA above
Archaeological and Historic Preservation Act of 1974, (16 USC 469 *et seq*)	See NHPA above.
Submerged Lands Act, (Public Law 82-3167; 43 USC 1301 *et seq*)	None occur on site.

8.0 AGENCIES CONSULTED AND PUBLIC NOTIFICATION

The notification process includes mailing a project notice to agencies and other stakeholders regarding the availability of this SEA. The following agencies are listed as placeholders; a summary of the comments will be entered after the comment period has ended. Comments and responses will be placed into Appendix

A. Federal agencies:
1) U.S. Environmental Protection Agency (EPA Region 9)
2) Advisory Council – Historic Preservation
3) U.S. Fish and Wildlife Service
4) National Park Service, Lava Beds National Monument & Crater Lake National Park
5) United States Forest Service

B. State and local agencies:
3) State Lands Commission
4) State Historic Preservation Officer
5) North Coast Regional Water Quality Control Board Region

C. Native American Tribes:
1) The Klamath Tribes
2) The Karuk Tribe
3) The Yurok Tribe
4) The Hoopa Valley Tribe
5) The Shasta Indian Nation
6) The Confederated Tribes of the Grand Ronde Community of Oregon
7) The Confederated Tribes of Siletz Indians
8) Other interested or affected Tribes

9.0 MITIGATION MEASURES

Biological Measures. No change from previous EA.

Erosion Control Measures- Geotextile filter fabric would encapsulate the island fill used to form the island core. The geotextile fabric would prevent subsidence of the fill into the underlying native substrate, prevent erosion of the core material through the rip rap and prevent the nesting substrate from sifting downward into the core material. A two-foot layer of rip rap would be placed on the windward (northwest) side to afford additional protection from wind-generated waves. Elsewhere along the island shoreline, a one-foot layer of rip rap would be placed to protect the island slopes.

Geotextile fabric will also be placed on the access road to each island during construction to prevent pumping of sediments due to truck traffic.

Turbidity Measures. Construction of the rock island will occur in low to normal water levels in Sheepy Lake. Minor turbidity is expected from the initial construction of the temporary access road and while building the core of the islands. The contractor will follow the standard sediment control plan set forth in the contract specifications minimized sediment drift during in-water work.

Dust Control. Water trucks will water down portions of gravel roads used to transport materials to project sites in order to decrease the amount of fine matter particulates entering the air.

Vegetation Restoration Measures. The 1,900 foot long and 15 foot wide temporary road used to access the land location of the island will be lined with geo-fabric before constructing the access road. These materials will be fully removed following construction of the island in which the natural vegetation, most hard stem bulrush is expected to recover quickly without the need for plantings. This was realized at after the construction of the Tule Lake Island in 2009.

Similarly, the temporary staging area will be located on a natural grass pasture that is periodically grazed by cattle. Geo-fabric and several inches of rock will be placed on the vegetation and use for staging equipment and materials. All materials will be removed following construction in which the mixed native and non-native pasture grasses are expected to be dormant and be able to recover naturally the following growing season, post construction.

10.0 DETERMINATION AND STATEMENT OF FINDINGS

A Finding of no Significant Impact (FONSI) (33 CFR Part 325) is anticipated. The FONSI will be prepared after agency and stakeholder comments to this Environmental Assessment. A draft FONSI is attached.

DRAFT (Amended) Finding Of No Significant Impact (FONSI)
Supplemental Environmental Assessment
Caspian Tern Nesting Island Construction Project
Tule Lake And Lower Klamath National Wildlife Refuges
June 2017

I. Action. The action is the authorized demolition of a floating island and construction of a replacement rock island to provide nesting habitat for Caspian terns. In conjunction with social facilitation measures, this action is intended to continue to aid in a reduced number of Caspian terns nesting in the Columbia River Estuary, thereby reducing their predation on Endangered Species Act-listed juvenile salmonids. The project involves demolition of the floating island that has provided 0.8 acres of habitat since 2010 for a rock island to be built with a final 0.8 acres of nesting habitat. Sheepy Lake is a managed wetland unit on lands administered by the U.S. Fish and Wildlife Service. Materials to build the rock island will be imported from a local quarry sources, in which the island footprint will be take up approximately two acres of the 430 acre wetland unit. The wetland unit water level will be reduced to aid in construction of the rock island. A project requires construction of a 1900 foot temporary road and 4 acre staging area which will be removed following island construction. The floating island will be dismantled and trucked offsite to a local commercial landfill.

This project is described in the Supplemental Environmental Assessment for the Caspian Tern Nesting Island Construction Project, Tule Lake And Lower Klamath National Wildlife Refuges, Klamath Basin National Wildlife Refuge Complex, Siskiyou County, California And Klamath County, Oregon, which is incorporated herein (Attachment A).

II. Additional References. (1) *Caspian Tern Management to Reduce Predation of Juvenile Salmonids in the Columbia River Estuary* Final Environmental Impact Statement (USFWS et al. 2006); (2) *Caspian Tern Management to Reduce Predation of Juvenile Salmonids in the Columbia River Estuary* Record of Decision (ROD) (USACE 2006); (3) Endangered Species Act – Section 7 Consultation Biological Opinion and Magnuson-Stevens Conservation and Management Act Essential Fish Habitat Consultation for the *Caspian Tern Management to Reduce Predation of Juvenile Salmonids in the Columbia River Estuary* (NMFS 2006).

III. Factors Considered. Factors considered for this FONSI are impacts on air and water quality, fish and wildlife, endangered/threatened species, and aesthetics. In addition, indirect and cumulative impacts were addressed in the attached Environmental Assessment for this action.

IV. Conclusion. Based on the information obtained in the preparation of the Environmental Assessment for this proposal, the habitat restoration measures identified in the document, and the associated permits, it is concluded the proposed action will not have a significant impact on the quality of the human environment. Therefore, the preparation of an Environmental Impact Statement is not required.

Date	Jose L. Aguilar Colonel, U.S. Army Commanding

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PERSONAL COMMUNICATION

John Beckstand, USFWS Tule Lake NWR: telephone conversation

APPENDIX B: AGENCY AND PUBLIC COMMENTS AND RESPONSE