DEIS-APPENDIX 5

BIOLOGICAL ASSESSMENT/BIOLOGICAL OPINION, NAVIGATION IMPROVEMENTS, DELONG MOUNTAIN TERMNAL, ALASKA

5a. Biological Assessment of Steller's Eider Polysticta stelleri and Spectacled Eider Somateria fischeri for DeLong Mountain Terminal, Alaska. Prepared by U.S. Army Corps of Engineers Alaska District August 2003.

5b. Draft Biological Opinion For Dmt Portsite Navigation Improvements (Trestle-Channel Alternative).

Biological Assessment of Steller's Eider *Polysticta stelleri* and Spectacled Eider *Somateria fischeri*

for

DeLong Mountain Terminal, Alaska

Prepared by:

U.S. Army Corps of Engineers Alaska District

August 2003

An Assessment of the Biological Impacts on Steller's and Spectacled Eiders by the DeLong Mountain Terminal, Alaska.

Proposed Action

The U.S. Army Corps of Engineers (USACE), Alaska Industrial Development and Export Authority (AIDEA), and Teck-Cominco Alaska, a private corporation, propose to expand the existing DeLong Mountain Terminal facility (Portsite) on the eastern Chukchi Sea coastline, about 17 miles southwest of Kivalina and 80 miles northwest of Kotzebue. Alaska. Alternatives under consideration are: (1) no action and continue lightering ore concentrate with two barges, tugs, and mooring buoys, (2) add a third barge, assisting tugs, and mooring buoy to supplement existing conditions, (3) construct a breakwater to protect existing loading operations, (4) construct an offshore loading platform to load ore concentrate directly onto ships, and (5) continue lightering ore under existing conditions and construct an offshore fuel terminal.

The preferred alternative is alternative 4 called the Trestle-Channel Alternative. This alternative would connect a 90 by 300-foot-long loading platform to shore-based facilities with a 1,450-foot long trestle. The loading platform would have two ore concentrate loaders that would load ore concentrate directly into the holds of ocean-going ships. The ships would be about 700 feet long. Tugs would assist the ships with docking at the platform. Because the ships are much longer than the platform, a 164-foot catwalk would extend from the platform to a mooring dolphin seaward of the platform. A side and cross view of the trestle is pictured in figure 1. A plan view of the trestle and channel layout is shown figure 2.

The trestle would house: (1) a narrow roadway for vehicles to access the platform, (2) an enclosed conveyor to transport ore concentrate to the platform, and (3) a fuel pipeline to offload fuel from tankers. Ships loading and unloading at Portsite would access the loading platform through a channel and turning basin dredged to –53 feet MLLW (figure 2).

The trestle would be a box structure constructed of steel girders (figure 1). The roadway would be inside the box structure and the conveyor; the fuel pipeline and other utilities would be in a corridor at the top of the box structure, but under the conveyor housing (figure 3). The conveyor would be enclosed to prevent fugitive dust from escaping to the outside environment. Overall, the structure would be relatively compact and have a minimum of exposed bracing and no hanging cables or wires.

Two circular sheet pile cells 72 feet in diameter would support the trestle near shore, and steel-pile clusters would support the trestle and loading platform offshore (figure 1). The distance between the cells would be 300 feet. The distance between the piling clusters under the trestle would be 275 feet, but much closer under the platform. The distance between the water surface, or ice during winter, and the bottom of the trestle would be 40 feet MLLW, but would naturally vary slightly with tide and other water conditions. The overall height of the trestle would be 142 feet MLLW.

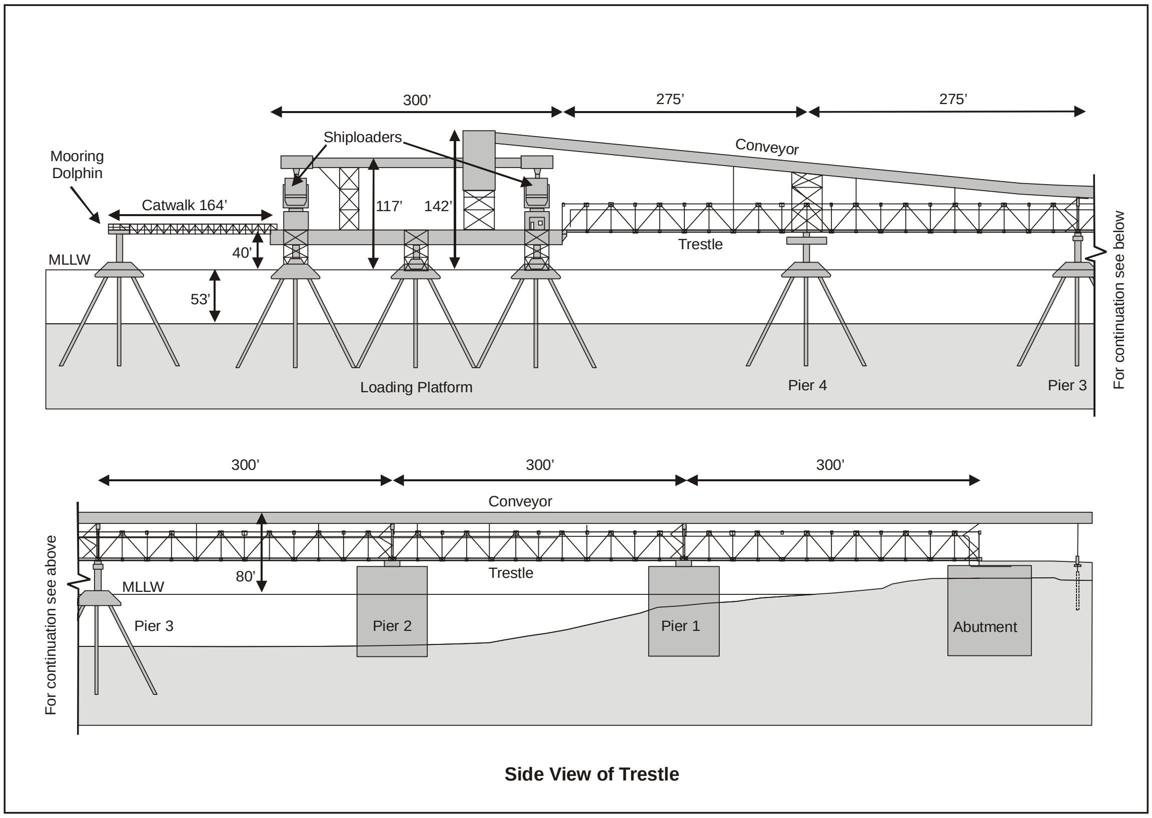

Figure 1. Side view of trestle concept showing dimensions.

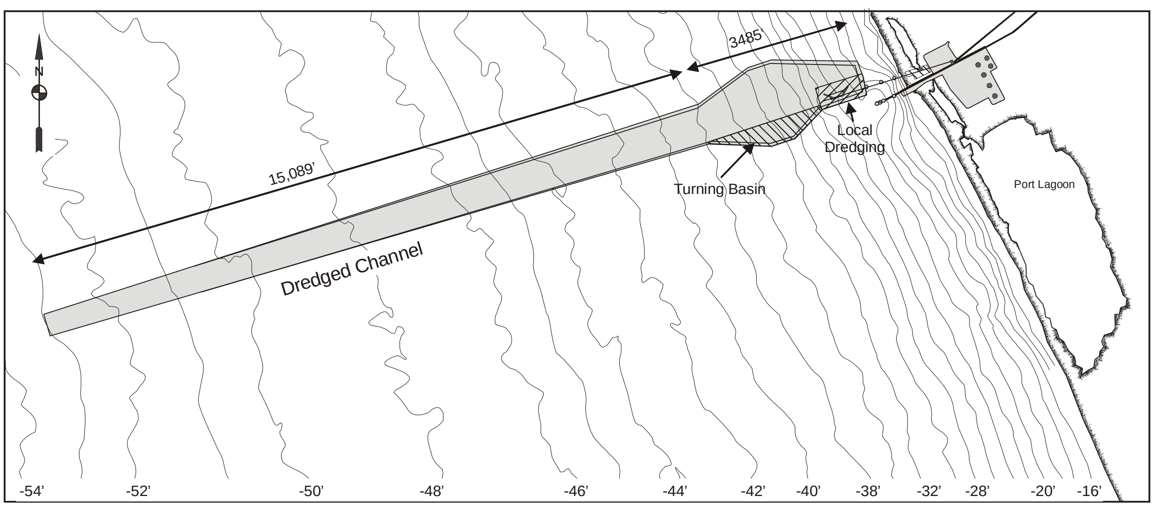

Figure 2. Plan view of the proposed dredged channel and turning basin.

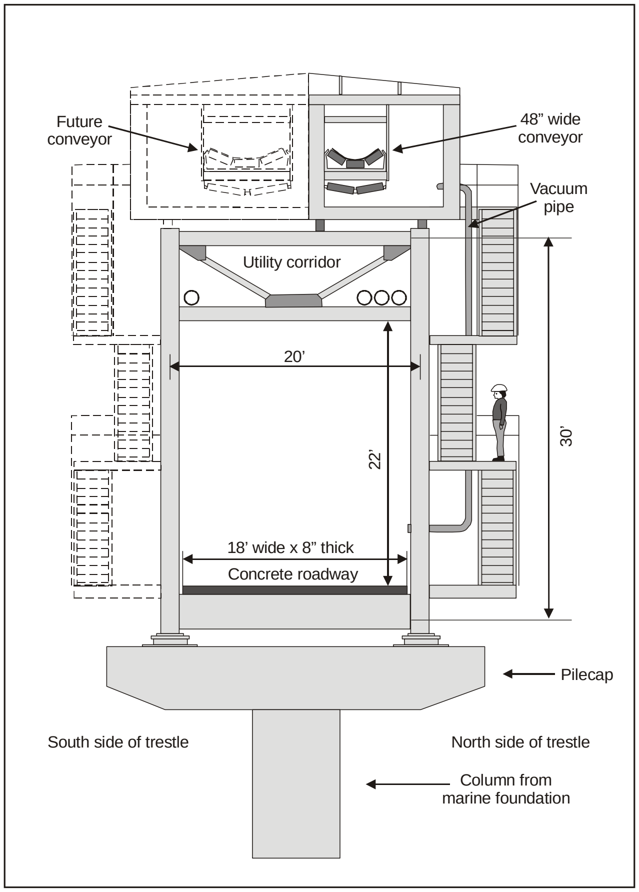

Figure 3. Cross section of the trestle proposed in the preferred alternative

Although it is daylight most of 24 hours during the summer loading season, the trestle and loading platform would have lights along the roadway and in the working area. One or more strobe lights would also be at high points on the trestle and platform. With exception of the strobes that are needed for aircraft safety, lights in the trestle and on the platform would be "downcast" lights to light only the work area and to minimize light scatter into the atmosphere. The masts of ships docked at the platform would be higher than the highest point on the trestle or platform and would have lights and rigging of unknown types that are not determined by construction of a trestle at Portsite. The ships currently anchor and are loaded 3 miles offshore, but would load ⅓ mile (1,900 feet) from shore after construction.

Endangered Species Act (ESA) Section 7 Consultation Process.

The U. S. Fish and Wildlife Service, Ecological Services Alaska, provides the following description of the ESA Section 7 consultation process (Balogh 1997). "When development occurs within the range of threatened or endangered (T&E) species, the agency proposing development is expected to consult with the U.S. Fish and Wildlife Service (USFWS) regarding the activity. The process begins informally with a request for a list of T&E species in the area of interest. If T&E species are present, then informal consultation begins. Should the informal consultation determine that a listed species might be affected by the proposed activity, the action agency prepares a biological assessment of the project. If it is then determined that a listed species is likely to be adversely affected, formal consultation results. During the formal consultation, the USFWS prepares a biological opinion, complete with a list of reasonable and prudent measures that the action agency is bound to adhere to. An incidental take document accompanies the biological opinion, and details how many individuals may be taken as a consequence of the action before consultation is re-initiated."

Endangered, threatened, and candidate species considered by the Corps of Engineers include: Northern right whale, finback whale, sei whale, bowhead whale, sperm whale, blue whale, humpback whale, Steller's sea lion, sea otter, spectacled eider, Steller's eider, Eskimo curlew, Aleutian shield fern, Snake River sockeye salmon, Snake River spring and summer Chinook salmon, Snake River fall Chinook salmon, lower Columbia River Chinook salmon, Puget Sound Chinook salmon, Upper Willamette River Chinook salmon, upper Columbia spring Chinook salmon, upper Columbia River steelhead, Snake River basin steelhead, lower Columbia River steelhead, upper Willamette River steelhead, and the middle Columbia River steelhead. These species are found in Alaska (USFWS 2002). Some of these species are found in the Bering and Chukchi seas, but most are not known to be present in the project area.

The Corps of Engineers initiated informal consultation with the U.S. Fish and Wildlife Service (FWS) and the National Marine Fisheries Service by requesting a list of threatened and endangered species present in the Portsite area. The agencies responded with their determination of T&E species and the FWS listed spectacled and Steller's eiders as occurring in the Portsite area. The National Marine Fisheries Service determined that bowhead whales were present in the Chukchi Sea, but were not expected to be in the project area. No biological assessment will be written on bowhead whales as a result of this determination. The agency determinations are found in Appendix A.

A biological assessment of the two species of seaducks listed by the FWS follows.

Steller's Eider

Species Description

The Alaska nesting population of Steller's eider was listed as a threatened species on June 11, 1997 (62 FR 31748). Critical habitat was designated for the Steller's eider on February 6, 2001 (65 FR 13262). The Steller's eider is the smallest of four eider species. The average weight of adult male and female Steller's eiders is 1.94 pounds (Bellrose 1980). Adult male Steller's eiders in breeding plumage have a black back, white shoulders, and a chestnut brown breast and belly. The males have a white head with black eye patches; they also have a black chin patch and a small greenish patch on the back of the head. Females and juveniles are mottled dark brown.

Life History

Longevity

Banding studies indicate that Steller's eiders can be long lived and are known to live at least 21 years and 4 months in the wild (band number 647-66747). Other ages recorded for this species in the wild are 20 years, 4 months (band numbers 647-66757 and 1077-13265), 19 years, 3 months (band number 647-64547), and 16 years (band numbers 1157-01787 and 1157-01876)(Chris Dau, personal communication 2000 *in* USFWS 2002).

Energetics

Steller's eiders winter at northern latitudes and are believed to spend the winter near the limits of their energetic threshold (Goudie and Ankney 1986 *in* USFWS 2002). Under this life history strategy, such species are vulnerable to perturbations within their winter habitat. Because Steller's eiders winter near their energetic threshold, they must also continue to feed upon reaching their nesting areas. Female Steller's eiders must continue to feed during incubation.

Age to Maturity

Steller's eiders reach sexual maturity at two years (Bellrose 1980).

Reproductive Strategy

Johnsgard (1994) indicated that pair formation for most sea ducks occurs in fall and spring. Metzner (1993) hypothesized that Steller's eiders at Izembek Lagoon and Cold Bay paired in the spring because they were apparently too preoccupied with feeding during the fall and winter to form pair bonds. Long-term pair bonds have been documented in other ducks (Bengtson 1972, Savard 1985, as in Cooke et al. 2000), but the length of time that Steller's eiders remain paired is unknown.

In Alaska, pairs of Steller's eiders arrive at their nesting areas as early as June 5 (Bent 1987). Steller's eiders often nest on coastal wetland tundra (Bent 1987, Quakenbush et al. 1995, Solovieva 1997), but some nest near shallow ponds or lakes well inland on the Arctic Coastal Plain.

Clutch size has been reported to range from 2 to 10 eggs (Bent 1987, Bellrose 1980, Quakenbush et al. 1995), but averages about 5 eggs near Barrow, Alaska. The average number of eggs in Russia is slightly higher at about 6 eggs per nest. Nesting success is variable and in some years, Steller's eiders near Barrow apparently do not even attempt to nest (Quakenbush et al., 1995).

Recruitment

Steller's eider recruitment rate (the percentage of young eiders that leave the nest and live to sexual maturity) is unknown (USFWS 2002). However, there is limited information on how many Steller's eider nests have eggs that hatch. In recent years, the number of nests near Barrow that produced ducklings seems to be declining and ranged from 83 percent in 1991 to 15 percent in 2000. In other years, Steller's eiders did not even attempt to nest near Barrow. The reason for relatively low nesting success or failure to nest by the Alaska nesting population is unknown.

Seasonal Distribution Patterns

Breeding Distribution: The exact historical breeding range of the Alaska-nesting population of Steller's eiders is not clear (USFWS 2002). The historical nesting range may have extended discontinuously from the eastern Aleutian Islands to the western and northern Alaska coasts, possibly east as far as the Canadian border. In more recent times, nesting occurred in two general areas, the Arctic Coastal Plain, and western Alaska, primarily on the Yukon-Kuskokwim Delta. Currently, Steller's eiders nest in relatively low numbers on the Alaskan Arctic Coastal Plain from approximately Point Lay east to Prudhoe Bay, and in extremely low numbers on the Yukon-Kuskokwim Delta. Female Steller's eiders, like the females of many other waterfowl species, likely return to the same site or locality every year to nest.

Post-Breeding Distribution, Fall Migration, and Molting: Following breeding, males, and some females with failed nests leave nesting areas and return to marine waters in July. Successful females and their broods gather on the coast later in the summer. The timing of departure and arrival of Steller's eiders at known staging points within their range was well documented by historical observation, but until the advent of satellite technology, little was known of how Steller's eiders used marine waters during their late summer and fall migration. Several Steller's eider from the Alaska nesting population were recently tracked through the summer and fall by fixing them with satellite transmitters while they were on nesting areas near Barrow (USFWS 2002). This study indicated that Steller's eiders from the Alaska nesting population ranged as far as the Russian Arctic coastline before gathering at known molting areas in bays along the coast of the southeastern Bering Sea. The flight routes of the tagged eiders can be viewed by contacting the U.S. Fish and Wildlife Service in Fairbanks, Alaska.

In late summer and fall, large numbers of Steller's eiders from both the Russian and Alaska populations gather to molt in a few lagoons on the north side of the Alaska Peninsula. Fewer numbers of eiders also apparently molt farther north in Kuskokwim Bay. Steller's eiders show strong site fidelity to these molting areas by returning year after year to the same bays and lagoons.

Winter Distribution: Following the molt many, but not all, Steller's eiders disperse from major molting areas to other parts of the Alaska Peninsula and Aleutian Islands (USFWS 2002). Winter ice formation often temporarily forces birds out of shallow protected areas such as Izembek and Nelson Lagoons. During the winter, this species congregates in select near-shore waters throughout the Alaska Peninsula and the Aleutian Islands, around Nunivak Island, the Pribilof Islands, the Kodiak Archipelago, and in Kachemak Bay. Although overall abundance in specific wintering areas on the south side of the Alaska Peninsula may depend on ice conditions along the north side of the Alaska Peninsula, Steller's eiders likely have a strong fidelity to specific wintering areas on the south side, with some birds occupying these areas during winter regardless of conditions on the north side.

Spring Migration: In the spring, Steller's eiders form large flocks along the north side of the Alaska Peninsula and generally move east and north (USFWS 2002). Spring migration usually includes movement along the coast, although birds may take shortcuts across large water bodies such as Bristol Bay. Steller's eiders show strong site fidelity for "favored" habitats during migration, where they congregate in large numbers to feed before continuing their northward migration.

Steller's eiders show strong fidelity to several areas along the southeastern Bering Sea/Bristol Bay coastline. These areas include: Bechevin Bay, Morzhovoi Bay, Izembek Lagoon, Nelson Lagoon/Port Moller Complex, Cape Seniavin, Seal Islands, Port Heiden, Cinder River State Critical Habitat Area, Ugashik Bay, Egegik Bay, Kulukak Bay, Togiak Bay, Nanwak Bay, Kuskokwim Bay, Goodnews Bay, and the south side of Nunivak Island.

Population Structure

It seems reasonable to assume that based on the high probability for site fidelity by nesting females and the distance between breeding populations on the Yukon-Kuskokwim Delta and the Arctic Coastal Plain (500 miles), the Alaska breeding population of Steller's eiders may contain unique geographic sub-populations (USFWS 2002). However, similarly distributed North Slope and Yukon-Kuskokwim Delta populations of spectacled eiders have distinct mitochondrial DNA markers that imply there is limited maternal gene flow between these two areas for spectacled eiders (Scribner et al. 2000 in USFWS 2002). Steller's eiders may have similar connections.

Food Habits

Steller's eiders employ a variety of foraging strategies that include diving to a maximum depth of at least 9 meters (30 feet), bill dipping, body tipping, and gleaning from the surface of water, plants, and mud (USFWS 2002). During the fall and winter, Steller's eiders opportunistically forage on a variety of invertebrates that are found in near-shore marine waters, but mussels comprise much of their diet in some molting lagoons. Steller's eiders food in freshwater nesting areas is believed to be mostly the relatively large, benthic larvae of the chironomid midge common in arctic tundra ponds.

Predators

Predators of Steller's eiders include snowy owls, short-eared owls, peregrine falcons, gyrfalcons, pomarine and long-tailed jaegers, rough-legged hawks, common ravens, glaucous gulls, arctic fox, and red fox. Owls, falcons and hawks kill mostly young and adult eiders while gulls, ravens and jeagers prey on eggs and ducklings. Foxes will eat eggs, ducklings, and kill nesting females if given the opportunity.

Man must also be considered a predator of Steller's eiders. Sport and subsistence hunting of Steller's eiders is prohibited in the United States, but eiders are still killed with firearms within their range.

Population Dynamics

Population Size

Yukon-Kuskokwim Delta: Estimating the size of the Steller's eider breeding population in Alaska has proved difficult because of large sampling errors associated with systematic aerial surveys. The upper limit of the Alaska nesting Yukon-Kuskokwim Delta population was estimated to be no more than 3,500 pairs during the 1950s and early 1960s (USFWS 1999). Biologists studying Steller's eider population dynamics believe that there are 90 percent or fewer Steller's eider today than there were in the 1950's.

Arctic Coastal Plain: Aerial breeding pair surveys that have been flown over the Arctic Coastal Plain of Alaska since 1992 are designed to provide optimal population estimates for spectacled eiders, but Steller's eiders nesting around Barrow are surveyed from the ground. Biologists most familiar with the species on its Arctic Coastal Plain nesting grounds believe that the Arctic nesting population is best described as numbering in the hundreds, or perhaps in the very low thousands.

Population Variability

Variability in the abundance of the Alaska breeding population of Steller's eiders is not well understood (USFWS 2002). The sampling errors around population estimates are large enough to obscure large annual population fluctuations, but ground surveys in the Barrow area suggest that the local breeding populations there fluctuate substantially, with no Steller's eiders nesting during some years.

Population Stability

The population of Steller's eiders molting and wintering along the Alaska Peninsula appears to be declining (USFWS 1999, USFWS 2002). Long-lived species like Steller's eiders typically do not have highly variable populations and mortality factors may be undermining their ability to maintain a stable population. The causes of decline could be varied and are largely unknown, but if the cause of the decline is within the marine environment, it is reasonable to conclude that the Alaska nesting population and Russia nesting population are being affected similarly because a significant portion of the Russian population winters with the Alaska population.

Status and Distribution

Reasons for Listing the Steller's eider as a Threatened Species.

The Alaska nesting population of Steller's eiders was listed as a threatened species on June 11, 1997 (USFWS 1997). It was listed due to (1) its recognition as a distinct vertebrate population segment, (2) a substantial decrease in the species' nesting range in Alaska, (3) a reduction in the number of Steller's eiders nesting in Alaska, and (4) the vulnerability of the remaining breeding population to extirpation. Specific reasons the U.S. Fish and Wildlife Service (1997) listed the Alaska nesting population are presented in the following paragraphs.

Habitat Loss: The direct and indirect effects of future gas/oil development within the National Petroleum Reserve-Alaska, and future village expansion (e.g., at Barrow), were cited as potential threats to the Steller's eider (USFWS 1997). Within the marine distribution of Steller's eiders, perceived threats include marine transport, commercial fishing, and environmental pollutants.

Hunting: Although not cited as a cause in the decline of Steller's eiders, the take of this species by subsistence hunters was cited as a threat to the population of Steller's eiders near Barrow in the final rule (USFWS 1997). Steller's eiders from the Alaska population that were fitted with satellite tags are now know to use marine waters off the Russian coast (P. Martin, USFWS, in e-mail distribution on tracking of tagged Steller's eiders) suggesting that Steller's eiders from the Alaska population could possibly be shot in Russia. Hunters from four Russian villages are reported to have shot from 3,000 to 4,500 Steller's eiders annually in the 1990's (Syroechkovski and Zockler undated).

Predation: Increased predation by arctic foxes (*Alopex lagopus*) resulting from the concurrent crash of goose populations is cited as a possible contributing factor to the decline of the Steller's eider on the Yukon-Kuskokwim Delta. The potential for increased predation near villages resulting from the villages' associated gull and raven populations was also cited as a potential threat to this species.

Lead Poisoning: The presence of lead shot in the nesting environment on the Yukon-Kuskokwim Delta was cited as a continuing potential threat to the Steller's eider. The Service is progressing in its efforts to enforce a nationwide ban on lead shot on the Arctic Coastal Plain. Local problems with lead in the Arctic still exist, particularly in areas where lead shot was or still is widely used for hunting. Lead pellets will continue to be eaten by birds as long as they remain in the environment. Effects of lead poisoning are apparent in some birds, such as the endangered Steller's eider in Alaska (AMAP 2002).

Ecosystem Change: Direct and indirect changes in the marine ecosystem caused by increasing populations of Pacific walrus, gray whale, and sea otter, were cited as potential causes of the decline of Steller's eiders (USFWS 1997). Subsequent declines in sea otter populations (65 FR 67343) and continuing declines in Steller's eider populations suggest that otters were not responsible for a decline in eider numbers. In addition, changes in the commercial fishing industry were also cited as perhaps causing a change in the marine ecosystem with possible effects upon eiders. However, the USFWS (2002) is unaware of any link between changes in the marine environment and contraction of the eider's breeding range in Alaska.

Range-wide Trend

Populations of Steller's eiders molting and wintering along the Alaska Peninsula have declined since the 1960s (Kertell 1991), and appear to be in continued decline (Flint et al. 2000, Larned 2000). The imprecision of breeding ground estimates precludes detection of any but the most obvious population trends for the listed entity. However, if a marine-based threat is causing a decline in the world population of Steller's eiders, then it seems reasonable to conclude that the Alaska breeding population may also be affected by such a threat.

New Threats

Chronic Petroleum Spills: The chronic release of petroleum products near large concentrations of Steller's eiders is not a new threat as much as it is a newly realized threat (USFWS 2002). The gregarious behavior of Steller's eiders during a spill event may result in acute and/or chronic toxicity in large numbers of birds.

A life-history strategy of long life and low annual reproductive effort would be expected to evolve under conditions of predictable and stable non-breeding environments (Sterns 1992). The life history strategy of the Steller's eider seems to fit this model. That is, the Steller's eider is long-lived, has low annual recruitment, and winters in apparently productive and reasonably stable near-shore marine environments. Because the Steller's eider is relatively small-bodied and winters at northern latitudes, it may do so near the limits of its energetic threshold. Environmental perturbations that reduce prey availability or increase the species energetic needs may result in harm. Fuels and oils are toxic to Steller's eiders and their food resources including amphipods and snails. Therefore, spilled petroleum is likely to indirectly affect Steller's eiders through harm to food resources.

Collisions with Manmade Structures: Steller's eiders are known to collide with wires, communication towers, boats, and other structures. During a 4-year period near Barrow, at least one adult Steller's eider female died from striking a wire and another adult Steller's eider was suspected to have died from striking a radio tower (Quakenbush et al., 1995). In addition, large numbers of Steller's eiders are known to have collided with communication towers along the Alaska Peninsula. An attraction of sea birds, including eiders, to the bright lights used by fishing boats and other vessels is well documented in literature and the testimony of vessel crews. The actual number of birds injured and killed through collisions with manmade structures is likely higher because many injured and killed birds are believed to go undetected, unreported, or become scavenged before they are found.

Stochastic Events: The small population size of the Steller's eiders on the Yukon-Kuskokwim Delta and the Arctic Coastal Plain may put them at risk of the deleterious effects of demographic and environmental stochasticity. Demographic stochasticity refers to random events, such as shifts in sex ratios, striking wires, being shot, oil/fuel spills, that affect the survival and reproduction of individuals (Goodman 1987). Environmental stochasticity is due to random, or at least unpredictable, changes in factors such as weather, food supply, and populations of predators (Shaffer 1987). Small populations will have difficulty surviving the combined effects of demographic and environmental stochasticity (Gilpen 1987). The risk of local extirpation is probably highest for Steller's eiders nesting on the Yukon-Kuskokwim Delta due to the low number of birds that breed there.

The world population of Steller's eiders is probably not at high risk of extinction due to environmental stochasticity alone, but local groups of wintering birds may be vulnerable to starvation due to stochastic events such as unusually heavy ice cover in their feeding habitats (USFWS 2002).

Critical Habitat

Critical habitat was designated for the Steller's eider on February 6, 2001 (65 FR 13262). Designated critical habitat includes the Yukon-Kuskokwim Delta nesting areas and the Kuskokwim Shoals fall molting and spring staging area. Other critical habitat includes molting and staging lagoons along the north coast of the Alaska Peninsula including the Seal Islands, Nelson Lagoon and Port Moller, and Izembek Lagoon. Maps of critical habitat for Steller's eiders are presented in the U.S. Fish and Wildlife Service publication, *Alaska's Threatened and Endangered Species*, October 2002. The nesting area around Barrow, and specific wintering areas south of the Alaska Peninsula and in the Aleutian Islands are not designated as critical habitat.

Steller's Eiders in the Portsite Area

Traditional knowledge. Three Iñupiaq elders from the village of Kivalina, who have long histories of subsistence hunting, were asked independently about their knowledge of Steller's eiders in the Portsite/Kivalina areas. Their consensuses was that Steller's eiders are not often seen in the Portsite/Kivalina area now, but were relatively common along the coast north of Kivalina in the 1940's and 1950's. Elders commenting on the occurrence of Steller's eiders were: Willard Adams Sr., Russell Adams Sr. and Joe Swan Sr.

Migratory field notes were collected at Kivalina, Alaska, during November of 1997 and published by the Alaska Department of Fish and Game in Technical Paper No. 260 (Georgette 2000). Kivalina is 17 miles north of Portsite and people from this community would have the most accurate traditional knowledge on the occurrence of Steller's and spectacled eiders in the Portsite/Kivalina area. According to this traditional knowledge, Steller's eiders pass through the Kivalina area only once in a while (Georgette 2000, page 133). A comment on the occurrence of Steller's eiders at Point Hope (80 miles north of Portsite) was also made at Kivalina (Georgette 2000, page 130). Traditional knowledge is that there are not too many Steller's and spectacled eiders around Point Hope. According to traditional knowledge Steller's eiders come around Point Hope in June and July (including males) and again in the fall (females and juveniles).

Technical Report No. 260 includes the Northwest Arctic region of Alaska. According to the regional traditional knowledge included in this report, spectacled eiders are rare in the region and Steller's eiders are even rarer (Georgette 2000, page 16).

Previous Studies. Williamson et al. (1966) listed Steller's eiders as occurring in the Cape Thompson area 60 miles north of Portsite during surveys for Project Chariot at Ogotoruk Creek (Wilimovsky and Wolfe 1966). Steller's eiders were listed as occupying marine littoral, lacustrine waters, and beach environments in order of affinity. In this study, marine littoral waters extended seaward 2 miles from shore. Steller's eiders were listed as present from June 1 through October 4 and uncommon, but possibly breeding in the area.

Marine birds including sea ducks were surveyed during spring, summer and fall surveys prior to construction of the existing Portsite (Dames and Moore 1983). Areas surrounding the existing Portsite and south of Cape Thompson were surveyed. No Steller's eiders were seen during either of these surveys (Erickson and Hettinger 1983, Erickson 1983).

Current Studies. Several surveys of birds in the Portsite and Kivalina areas were done since 1998. The 1998 survey (RWJ 1999) was an informal survey of waterfowl that used the north and south Portsite lagoons. Portsite employees generally untrained in bird identification conducted this survey and no Steller's eiders were noted. Additional informal surveys of migrating and summer resident waterfowl using the lagoons and coastal ponds along the beach within about 2 miles north and south of Portsite were done during the spring, summer and fall of 2000 and 2001 (RWJ 2001a, RWJ 2001b). Trained biologists employed by the U.S. Army Corps of Engineers and the U.S. Fish and Wildlife Service, and local Natives with traditional knowledge made these surveys. Common eiders were occasionally seen at the existing Portsite and Steller's eiders seen during these surveys are mentioned in the section describing current sightings below.

The Corps of Engineers conducted two surveys of waterfowl at the southern end of Kivalina Lagoon 15 miles north of Portsite, one during September 2000 and a second during June 2001. The September survey was intended to observe southward migrating waterfowl that use lagoons and ponds in the south Kivalina Lagoon area, and the June survey was intended to observe all species of birds using this same area during the nesting season. No Steller's eiders were seen during these surveys.

The U.S. Fish and Wildlife Service implanted transponder tags in several breeding Steller's eiders near Barrow during 2000 and 2001 (P. Martin personal communication). The movements of these tagged Steller's eiders were tracked by satellite. Tagged Steller's eiders used littoral marine waters at Point Hope 80 miles north and at Cape Espenberg 110 miles south of Portsite in July 2000, and about 50 miles north of Portsite in August 2000, but none used marine waters in the vicinity of Portsite.

Current sightings. As mentioned earlier, spring migration usually includes movement along the coast, although birds may take shortcuts across large water bodies such as Bristol Bay. If Steller's eiders will shortcut across large expanses of water such as Bristol Bay when there are important staging and spring conditioning areas along the coastline, it stands to reason that Steller's eiders would also shortcut across relatively unproductive (for Steller's eiders) waters such as Kotzebue Sound. The southeastern

Chukchi Sea off Portsite is covered with ice and has an extensive network of leads beyond the sight of land when Steller's eiders are migrating to the Arctic Plain nesting areas near Barrow. Many Arctic species of wildlife use these offshore leads as "highways" to summer areas and pass by Portsite undetected by humans on shore. According to traditional knowledge, Steller's eiders migrate far offshore and seldom come inshore near Portsite.

On occasion, however, anomalies in weather bring these offshore migrating species inshore where humans can see them. Williamson et al. (1966), while surveying birds during Project Chariot near Cape Thompson (Wilimovsky and Wolfe 1966) noted that all four species of eiders conspicuously moved inshore from offshore flight paths during periods of foggy weather. We believe that a weather anomaly resulted in uncommon observations of Steller's eiders at Portsite during the spring of 2000 when 4 small flocks of up to 35 Steller's eiders were seen flying up the coast at the existing Portsite immediately after a relatively strong southwest wind.

Consequences of Alternatives on Steller's eiders.

The project alternatives for the Portsite are described in Chapter 2 of the DMT EIS. Only the Trestle-Channel alternative and the mono-pile concept of the Fuel Island Terminal alternative would potentially have any impact on sea ducks and birds including Steller's eiders. The Trestle-Channel alternative is the preferred alternative and only this alternative is considered further.

Steller's eiders migrate along offshore leads and few Steller's eiders are expected to be in the Portsite area, but the principal concern for Steller's eiders that could be in the area would be collision with the trestle when it is dark or during foggy weather. Collision with structures and vessels by sea birds in general, including Steller's eiders, is relatively common and often, but not always, associated with an attraction to lights at night (see section on Collisions with Manmade Structures above). It is daylight most of the day during the northward migration, and collision with a trestle because of attraction to artificial light is not expected to be a problem, but collision with the trestle during foggy weather sometime over the 50-year life of the project is possible. Steller's eiders have collided with wires and towers near Barrow during daylight, but there are no known instances of Steller's eiders or other seabirds colliding with structures or ships at the existing Portsite.

Mitigative measures to prevent attraction to the trestle would include the use of "downcast" lights that light work areas while minimizing light scatter into the atmosphere. Another mitigative measure would include minimization of hanging cables, wires, and projections that could possibly injure birds. Bright colored paint is also a possible mitigative measure to reduce the probability of collision during daylight. Most birds can see in red, green, blue, and UV colors, and brightly colored paint in reds, greens or blues may make the trestle more "visible" to birds as having "color", while it would not be visible to color blind marine mammals as color.

Spectacled eider

Species Description

The Alaska and Russian populations of spectacled eider were listed as a threatened species on June 9, 1993 (50 CFR Part 17). Critical habitat was designated for the Steller's eider on February 6, 2001 (66 FR 9146 9185). The spectacled eider is a large-bodied sea duck and one of three eiders in the genus, *Somateria*. The other two eiders of this genus are the king eider and the common eider. The adult male spectacled eider has a green head with a long, sloping forehead, and large, distinctive white eye patches, a black chest and a white back. Juveniles and adult females are brown with less distinct spectacle eye patches.

Life History

Longevity

Few data are available on the overall longevity of spectacled eiders, but like other eiders, they would likely be long-lived because their population stability would depend on a long life, high adult survival, coupled with a few successful years of reproduction.

Energetics

Recent discovery of the wintering areas of spectacled eiders suggest that they forage for benthic bivalves in the shifting pack ice of the Bering Sea (Lovvorn et al. 2000). This energetically expensive method of foraging requires high food densities and intake rates necessary to build up fat reserves vital for spring migration and breeding. High densities of clams are present in the overwintering area. Sampling over several decades suggests that the benthic community in the overwintering area has shifted from larger to smaller species of clams (Lovvorn et al. 2000). Spectacled eiders apparently do not exist so close to their energetic threshold as do Steller's eiders because they arrive on the nesting grounds fit enough to fast through egg laying and incubation (USFWS 1993), but changes in the spectacled eider prey base in the overwintering area could be affecting the overwinter survival and ability of spectacled eiders to maintain the body condition necessary for spring migration and breeding.

Age to Maturity

Age at first breeding has not been determined but probably occurs most often in the third year for females and the third or fourth year in males, coinciding with the acquisition of definitive plumage (USFWS 1999). Breeding as early as 2 years of age has been documented among wild and captive spectacled eiders.

Reproductive Strategy

Most spectacled eiders are believed to form pair bonds before reaching the nesting grounds (USFWS 1999). Males take no part in incubation or brood rearing. Males stay with the females for 1 to 2 weeks into incubation of eggs and then depart the nesting grounds for the marine environment by mid to late June. Females with failed nests depart for the marine environment by late July. Successful females and their broods move directly from freshwater to marine habitats in early September after the brood has fledged. Fledging occurs approximately 50 days post-hatching.

Female spectacled eiders show strong fidelity to nesting sites and often return to within 1 mile of the same nesting area. They nest in sedge meadow tundra, on peninsulas in lakes and on islands in lakes up to 5 or 10 miles inland from the coast. On the Yukon-Kuskokwim Delta, the nests of spectacled eiders are typically, but not always dispersed and often associated with other waterfowl. Nests are constructed by the female and consist of shallow depression in the vegetation covered with grasses and down.

The nesting grounds are typically flooded with snowmelt for a week or two after spectacled eiders arrive. Nesting starts in late May and continues through mid to late June. On the Yukon-Kuskokwim Delta nesting starts approximately 7 days, and peaks about 12 days, after first arrival (Dau 1974). Spectacled eider nesting chronology was 12 days earlier than 2001, and 7 days earlier than the 1986-2001 average (Bowman et al. 2002). Spectacled eiders lay one egg per day, usually in early afternoon, and begin incubation with the last or penultimate egg. Incubation lasts 20 to 25 days. The number of eggs laid, or clutch size, ranges from 1 to 8 and averages 5 eggs. Clutches started early in the nesting season are on average larger and likely to be more successful than clutches that are started later in the season. Most broods are raised within 3 miles of where they were hatched.

Recruitment
Recruitment rate (the percentage of young eiders that leave the nest and live to sexual maturity) of spectacled eiders is unknown (USFWS 1999). The nesting success of spectacled eiders is variable. Nesting success (the percentage of nests that successfully hatch at least one egg) on the Yukon-Kuskokwim Delta varied from 20 to 95 percent depending on year and location. Nesting success on the Yukon-Kuskokwim Delta in 2002 was similar to other years (Bowman et al. 2002). The total nest population on the Yukon-Kuskokwim Delta in 2002 was estimated to be 2,831 nests.

The only quantitative measure of adult female and duckling survival is from study at Hock Slough on the Yukon-Kuskokwim Delta: over the first 30 days of the brood rearing period in 1993-1995, adult female survival averaged 93 percent, and duckling survival averaged 34 percent (Flint and Grand 1997). Physiological stresses occurring partially as a result of this abrupt shift from freshwater to marine habitats may cause significant juvenile mortality (Dau 1974).

Seasonal Distribution Patterns
Breeding Distribution: Spectacled eiders breed discontinuously along the coast of Alaska from the Nushagak Peninsula on Bristol Bay north to Barrow and east nearly to the Yukon border (USFWS 1999). They were known to nest on St. Lawrence Island, Alaska and along the Arctic coast of Russia from the Chukotka Peninsula west to the Yana Delta. Known high-density breeding grounds for spectacled eiders are the Yukon-Kuskokwim Delta in Alaska and the Chaun, Kolyma, Yana and Indigirka deltas in Siberia.

Post-Breeding Distribution, Fall Migration, and Molting:

Breeding males leave the nesting grounds for the marine environment by mid to late June. Exactly where they went from there was not well known until methods of tracking tagged eiders by satellite were developed. It is now known that adult spectacled eiders congregate to molt in large flocks along coastal areas during late summer. Four principal molting areas are known: (1) Ledyard Bay in the northeastern Chukchi Sea, (2) Norton Sound in the Northeastern Bering Sea, (3) Mechigmenskiy Bay in Russia, and (4) an area between the Indigirka River and Kolyma River deltas in Russia. Where non-breeding flocks spend the summer is not well known, but they are believed to congregate in small flocks in coastal waters through out their range (USFWS 2002).

Winter Distribution: The only known wintering area in the world for spectacled eiders is in offshore waters from 165 to 200 feet deep about 65 miles south of Saint Lawrence Island (USFWS 2002). Spectacled eiders congregate in open areas in pack ice by the thousands. The open areas are kept ice-free by the shear numbers of eiders present.

Spring Migration: Migration routes in the spring are not well known, but at least for breeding adults, the routes are believed to be direct between the wintering area south of Saint Lawrence Island and the nesting grounds on the Yukon-Kuskokwim Delta, Arctic slope, or Russia (USFWS 1999, USFWS 2002). The routes of non-breeding birds are likely to be along coastal areas within their range where they are believed to spend the summer in small flocks of up to 100 birds (USFWS 2002).

Population Structure

It seems reasonable to assume that based on the high probability for site fidelity by nesting females and the distance between breeding populations on the Yukon-Kuskokwim Delta and the Arctic Coastal Plain (500 miles), the Alaska breeding population of spectacled eiders may contain unique geographic sub-populations. However, distinct mitochondrial DNA markers imply there is limited maternal gene flow between these two areas (Scribner et al. 2000).

Food Habits The diet of spectacled eiders has been studied only within their breeding grounds and the associated nearshore marine environment. In the littoral marine environment, Dau and Kistchinski (1977) suggest that they feed primarily on benthic mollusks and crustaceans in shallow waters less than about 100 feet deep. Kessel (1989) hypothesized that they also may forage on pelagic amphipods that are concentrated along the sea water-pack ice interface. On their coastal breeding grounds, spectacled eiders feed on aquatic crustaceans, aquatic insects, and plant materials (Dau 1974).

The world population of spectacled eiders winters in large flocks in open water in the pack ice over water 165 to 200 feet deep about 60 miles south of Saint Lawrence Island (USFWS 2002). Although the food habits of wintering spectacled eiders are undocumented because of the recentness and remoteness of this discovery, it is likely that spectacled eiders are diving to feed on clam resources known to be at this depth (Lovvorn et al. 2000). Shifts in prey species on this wintering area may have long-reaching effects on the world population of spectacled eiders (see Energetics section above).

Predators

Predation is believed to be a principal cause for nesting failure in many waterfowl species including spectacled eiders. Substantive depredations of waterfowl eggs and young in the Arctic region are sometimes associated with predators gaining access to isolated populations. For example, waterfowl nesting colonies on islands might suffer severe losses if foxes access nesting sites over ice or across mudflats. The greatest impact on waterfowl populations often occurs when Arctic fox densities are high and densities of nesting waterfowl are low. Decreases in availability of secure nest sites following destruction of islands by storm surges and ice scouring contributed to the decline in the spectacled eider population on the Yukon-Kuskokwim Delta (Dau, unpublished, in Ely et al. 1994).

Predators of spectacled eiders include snowy owls, peregrine falcons, gyrfalcon, pomarine and long-tailed jaegers, rough-legged hawks, common raven, glaucous gulls, Arctic fox, and red fox. Owls, falcons, and hawks kill mostly young and adult eiders, while gulls, ravens, and jeagers prey on eggs and ducklings. Foxes will eat eggs, ducklings, and kill nesting females if given the opportunity. Excessive predation of nesting hens by foxes and other predators can result in imbalanced sex ratios within populations.

Man must also be considered a predator of spectacled eiders. Sport and subsistence hunting of Steller’s and spectacled eiders in the United States is prohibited, but eiders are still killed with firearms. The USFWS (1993) estimates that 334 spectacled eiders, or about 5 percent of the breeding population, were harvested yearly from 1985 through 1992. The average annual take of eiders of all species by subsistence hunting on the Yukon-Kuskokwim Delta was estimated to be fairly constant at 3 to 4 thousand eiders for 25 years prior to 1991.

Over-harvesting of eiders including spectacled eiders may have eliminated local breeding birds from suitable habitat near villages in western Alaska. Currently Seaweb, an environmental organization, estimates that 4 percent of breeding adult spectacled eiders are shot and killed in this in the Yukon-Kuskokwim Delta region each year (Seaweb 2002). This estimate might equate to roughly about 68 to 120 spectacled eiders based on current breeding population estimates. There are no estimates on numbers taken from the breeding population on the North Slope.

Even though spectacled eiders are listed as endangered in IUCN Russian “Red Books,” mortality from subsistence hunting are reportedly high in Russia with 700 to 1,500 spectacled eiders shot annually in the 1990’s by hunters from only four Russian villages (Syroechkovski and Zockler undated). This mortality does not take into account mortality resulting from other Russian villages within the range of spectacled eiders. Seasons and rules are often violated with all species of eiders being hunted, including those listed in Red Books (Shevchenko and Klokov 2001)

Population Dynamics

Population Size
The world population of spectacled eiders, as estimated by the U.S. Fish and Wildlife Service from eiders wintering in the only known wintering area for the species, is about 363,000 birds (USFWS 2002). Population stability in sea ducks like spectacled eiders is dependent on high adult survival and occasional years of successful reproduction. The U.S. Fish and Wildlife Service estimated that 1,700 to 3,000 pairs nested on the Yukon-Kuskokwim Delta in 1990 to 1992 and as many as a few thousand pairs may nest on Alaska's North Slope.

<u>Yukon-Kuskokwim Delta</u>: The estimated 1,700 to 3,000 pairs nesting on the Yukon-Kuskokwim Delta since 1990 represents a 94 to 98 percent decline from 47,700 to 70,000 pairs estimated in the early 1970s. Further evidence that the decline in spectacled eiders on their primary breeding range in the Yukon-Kuskokwim Delta is substantial and unabated, comes from aerial waterfowl surveys and nest plot studies.

<u>Arctic Coastal Plain</u>: The North Slope of Alaska may have supported 3,000 pairs 20 years ago (Dau and Kistchinski 1977). Surveys initiated by the U.S. Fish and Wildlife Service in 1992 indicate that up to a few thousand pairs may still nest on the North Slope.

<u>Russian Population</u>: Spectacled eider populations are not surveyed systematically in Siberia but are believed to be dwindling on the Indigirka Delta, the center of Siberian breeding range (USFWS 1999). No recent studies, however, have been conducted in that region. Dr. Aleksandr Golovkin of the Institute of Nature Conservation in Moscow estimates that the current Russian population is about 20,000 breeding birds; however, he explains that this estimate is based on old data from few nesting areas and may be inaccurate. Other Russian biologists indicate that data are insufficient for estimating current population size or trends in Russia (Vladimir Flint 1992, Tomkovich 1991 *in* USFWS 1999).

Population Variability
Variability in the abundance of the Alaska breeding population of spectacled eiders is not well understood (USFWS 1999). The sampling errors around our population estimates are large enough to obscure large annual population fluctuations, but ground surveys in the Barrow area suggest that the local breeding populations there fluctuate with fewer spectacled eiders nesting during some years. Breeding populations on the Yukon-Kuskokwim Delta may currently have stabilized at around 2,000 to 3,000 pairs nesting annually.

Population Stability
The world population of spectacled eiders has declined substantially during the past 30 years, and may be continuing to decline (USFWS 1999, USFWS 2002). Long-lived species like spectacled eiders typically do not have highly variable populations and unknown mortality factors may be undermining their ability to maintain a stable

population. The causes of decline could be varied and are largely unknown, but if the cause of the decline is within the marine environment, it is reasonable to conclude that the Alaska nesting population and the Russia nesting population are being affected similarly because the Russian population and the Alaska population winter together in the Bering Sea.

Status

Reasons for Listing the spectacled eider as a Threatened Species (USFWS 1993).
The U. S. Fish and Wildlife Service estimates that approximately 1,700 to 3,000 pairs of spectacled eiders nested on their historically important breeding range on the Yukon-Kuskokwim Delta during 1990-92, where an estimated 47,740 to 70,000 pairs nested 20 years ago (USFWS 1993). This 94 to 98 percent decline is corroborated by the 7 percent per year decline in the number of all eiders seen on breeding pair surveys in southwestern Alaska since 1957 and the 14 percent per year decline in spectacled eider nest densities on the Yukon Delta National Wildlife Refuge since 1986. The geographically separate breeding segment in Prudhoe Bay, Alaska, has declined at a similar annual rate, equivalent to 80 percent from 1981 to 1991.

Although the factors that caused these declines are unknown, a number of potential contributory factors have been identified. These, or other still-unidentified threats have increased mortality above the rate of reproductive replacements. If the downward trend in nest densities continues unabated, the Yukon-Kuskokwim Delta breeding segment will be reduced to 50 percent every 4 years (Stehn et al. 1992a *in* USFWS 1993). Based on data from Prudhoe Bay and the Yukon-Kuskokwim Delta, spectacled eiders are declining at about the same rate throughout their Alaskan breeding range. No data are available to show whether similar trends have affected the breeding population in Russia where as many as 40,000 pairs traditionally nested.

<u>Habitat Loss</u>: The destruction of habitat is not known to be a factor in the decline of the spectacled eider (USFWS 1993). Breeding habitat encompasses vast expanses of coastal tundra and ponds that remain predominantly unaltered and uninhabited. No development or other substantial threats to the species' principal breeding habitat on the Yukon Delta National Wildlife Refuge are foreseen. Habitat continues to be degraded by lead pellets deposited from years of subsistence hunting on the Yukon-Kuskokwim Delta nesting grounds and on the Arctic plain.

<u>Hunting</u>: Alaskan and Siberian Natives have traditionally harvested eiders and eggs during migration and nesting.

In recent years, spectacled eiders in Alaska have apparently been taken in low numbers for subsistence and minimally for sport use, but range-wide and local effects of this harvest are not determined (USFWS 1993). Sport harvest of spectacled eiders in the United States was limited primarily to a few taken annually by collectors on St. Lawrence Island until the U.S. sport hunting season was closed in 1991. Eiders are harvested by Native Siberians on the Chukotka Peninsula and farther west (See hunting section above).

The estimated, annual subsistence harvest on the Yukon-Kuskokwim Delta from 1985 to 1992 averaged 334 spectacled eiders, equivalent to about 5 percent of the average, local nesting population during those years. Low numbers of spectacled eiders are also harvested on the Alaskan Arctic plain (USFWS 1993).

Predation: Mammalian and avian predators, particularly Arctic fox, glaucous gulls, and parasitic jaegers all eat eider eggs, young, and occasionally adults.

Eiders historically nested in association with geese possibly as a strategy to reduce predation losses, but when the numbers of geese declined sharply during the past few decades in Alaska, fox predation on eider eggs may have increased. Numbers of gulls and ravens may also have increased in Alaska, resulting in increased predation on eider eggs and hatchlings. Spectacled eider nest and brood survival are sometimes high near gull colonies on the Yukon-Kuskokwim Delta (USFWS 1993), but increasing populations of gulls and ravens due to human resources that benefit these species may put increasing pressure on spectacled eiders.

Lead Poisoning: Regulations requiring the use of non-toxic shot for hunting waterfowl, cranes, and snipe in Alaska were implemented for the 1991-1992 migratory bird-hunting season (50 CFR part 20.134). Lead shot is still used by some coastal residents of Alaska and Russia for hunting waterfowl and residual lead shot remains on the tundra or in shallow ponds for years, posing a prolonged risk to eiders. Studies by the U. S. Geological Survey (Flint et al 1997) show that up to 50 percent of the successfully breeding female eiders in one area of the Yukon-Kuskokwim Delta can be exposed to lead. These studies suggests that exposure to lead can lower the annual female survival rate by 34 percent.

Ecosystem Change: The spectacled eider's principal nesting grounds encompass about 5,000 square miles of coastal tundra on the Yukon Delta National Wildlife Refuge. Coastal habitats in the refuge have not been subject to seismic exploration or industrial development. Human use is limited essentially to subsistence activities and refuge operations. No Federal activities are foreseen that threaten the spectacled eider's coastal tundra habitat on this refuge.

At least 5,172 square miles of coastal plain on Alaska's North Slope may be spectacled eider nesting habitat, of which less than 1,250 square miles have been developed as oil production fields. No more than 65 square miles (1 percent) of the tundra wetlands within the oil fields have been altered by development. Spectacled eiders nest in low numbers in active oil fields and breeding pair densities in Prudhoe Bay are comparable to study sites in undeveloped regions of the North Slope (USFWS 1993).

Marine spectacled eider habitat in the United States may include some or all of the Northern Bering Sea, the Chukchi Sea, and the western Beaufort Sea. Changes in the Arctic ecosystem that may be affecting spectacled eiders are evident (AMAP 2002). For example, research indicates that the size of clams available to the worlds' population of wintering spectacled eiders has shifted to a smaller species, thereby possibly affecting population energetics necessary for subsequent breeding and nesting (Lovvorn et al. 2000). Major developments along the northwest coast of Alaska frequented by spectacled eiders consist of several larger village-cities including Nome, Kotzebue, and Barrow with moderate development such as harbors and large airports; a relatively small-in-area ore-loading port for the Red Dog Mine; and several smaller villages with little or no development beyond basic village needs including power generation and water supply utilities.

*New Threats to Spectacled eiders (*USFWS 1993).
Chronic Petroleum Spills: Future offshore oil and gas development could also pose a threat to spectacled eiders. In outer continental shelf waters, proposed lease sales could result in active exploration and development within spectacled eider wintering, migration, and molting habitat. State-controlled, nearshore marine waters may also be leased and developed.

Nesting habitat on the central coast of Alaska's North Slope, a small portion of the species' breeding range, has been altered by oil and gas development. Potential threats from this development include contamination from accidental spills, off-road vehicle use, wetland filling, and indirect effects of human presence. While the extent of spectacled eider nesting habitat impacted by oil and gas development is presently small, industrial development could expand in the future.

Petroleum products are sometimes spilled into the Bering Sea and may enter benthic or pelagic food chains. Proposed oil and gas leasing and potential development in State and outer continental shelf waters could impact eiders due to disturbance and oil spills. Production of oil in the outer continental shelf of the Bering and Chukchi Seas would substantially increase the probability of oil spills from platforms, pipelines, and tankers with potential effects on spectacled eiders. The anticipated increase in shipping activity in pack ice lead systems if offshore oil fields are developed could put eiders at risk of oil spill damages during critical migration, wintering, and molting periods, when they are highly concentrated or in flightless flocks. Similar impacts could occur with State leases in nearshore marine waters.

Collisions with Manmade Structures The Service recently received reports of birds, including unidentified eiders, striking commercial fishing vessels operating near the pack ice in the northern Bering Sea (Tuttle 1992 *in* USFWS 1993). High intensity lights on vessels sometimes attract seabirds including eiders, and result in collisions with the vessel or it's rigging. Because fishing boats sometimes operate in potential spectacled eider wintering range, collisions are a threat to the species. Collisions by eiders with fixed objects including towers and antennas in the winter range and along migration paths have also been documented (see section on Steller's eider).

Stochastic Events: The numbers of breeding spectacled eiders on the Yukon-Kuskokwim Delta and the Arctic Coastal Plain may put them at risk of the deleterious effects of demographic and environmental stochasticity. Demographic stochasticity refers to random events, such as shifts in sex ratios, striking wires, being shot, oil/fuel spills, that affect the survival and reproduction of individuals (Goodman 1987). Environmental stochasticity is due to random, or at least unpredictable, changes in factors such as weather, food supply, and populations of predators. Typically small populations have more difficulty surviving the combined effects of demographic and environmental stochasticity, but larger populations, such as spectacled eider, that depend on the stability of a relatively small area for wintering can also be affected. Disruption of food resources and parasite infections are known to have caused mass mortalities in common eiders (Camphuysen 2000). Severe weather can be a threat to Arctic sea ducks, and mass eider mortalities have been recorded after late spring storms on the Arctic Ocean (Myres 1958, Barry 1968 *in* USFWS 1993). The world's population of spectacled eiders might not be seriously affected by periodic mass mortalities on a local scale, but remnant or isolated populations are susceptible to mass mortalities due to natural events.

Critical Habitat

Critical habitat was designated for the spectacled eider on February 6, 2001 (66 FR 9146). Designated critical habitat includes the Yukon-Kuskokwim Delta nesting area, the Ledyard Bay and eastern Norton Sound fall molting areas, and the Saint Matthew/Saint Lawrence Island wintering area. Maps of critical habitat for spectacled eiders are presented in the U.S. Fish and Wildlife Service publication, *Alaska's Threatened and Endangered Species*, October 2002. The nesting area on the Arctic plain was not designated as critical habitat.

Spectacled eiders in the Portsite area.

Traditional Knowledge

Spectacled eiders migrate far offshore of the Portsite and Kivalina area. It is not surprising that there is little traditional knowledge of spectacled eiders for that area of the Chukchi Sea coastline. One elder hunter who has lived in Kivalina all his life said that spectacled eiders are vary rare in the Kivalina area, but that he occasionally sees a few mixed with common eiders as they migrate along offshore leads in the ice. Traditional knowledge also is that there are not too many spectacled eiders around Point Hope (Georgette 2000, page 130).

Migratory field notes were collected at Kivalina, Alaska, during November 1997 and published by the Alaska Department of Fish and Game in Technical Paper No. 260 (Georgette 2000). Technical Report No. 260 includes the Northwest Arctic region of Alaska. According to the regional traditional knowledge included in this report, spectacled eiders are rare in the region (Georgette 2000, page 16).

There is a general consensus among Iñupiaq Natives in the Barrow area that there are far fewer eiders, especially spectacled and Steller's eiders, than there were a few generations ago. Older hunters on the Chukchi Sea and Beaufort Sea coasts can recall thousands of eiders nesting and gathering along the shoreline (BLM 1982). The cause of the noted decline is not apparent, but speculation ranges from starvation, to pollution, to there being too many seagulls today.

Previous Studies
Williamson et al. (1966) listed spectacled eiders as occurring in the Cape Thompson area 60 miles north of Portsite during surveys for Project Chariot at Ogotoruk Creek (Wilimovsky and Wolfe 1966). Spectacled eiders were listed as occupying pelagic, marine littoral, lacustrine waters, and beach environments. Primary affinity was for marine littoral waters, followed by pelagic waters, lacustrine waters, and beach environments in order of affinity. In this study, pelagic waters extended seaward from 2 miles offshore. Spectacled eiders were listed as present from May 21 through September 26 and uncommon, but breeding in the Cape Thompson area.

Marine birds including sea ducks were surveyed during spring, summer and fall surveys prior to construction of the existing Portsite (Dames and Moore 1983). Areas surrounding the existing Portsite and south of Cape Thompson were surveyed. During these surveys, small numbers of spectacled eiders were seen in lagoons south of Cape Thompson near Cape Seppings (Erickson 1983).

Current Studies
Several surveys of birds in the Portsite and Kivalina areas have been conducted since 1998. The 1998 survey (RWJ 1999) was an informal survey of waterfowl that used the north and south portsite lagoons. Portsite employees generally untrained in bird identification conducted this survey and no spectacled eiders were noted. Additional informal surveys of migrating and summer resident waterfowl using the lagoons and coastal ponds along the beach within about 2 miles north and south of Portsite were done during the spring, summer and fall of 2000 and 2001 (RWJ 2001a, RWJ 2001b). Trained biologists employed by the U.S. Army Corps of Engineers and the U.S. Fish and Wildlife Service, and local Natives with traditional knowledge made these surveys. Common eiders were occasionally seen near Portsite, but no spectacled eiders were seen during the surveys.

The Corps of Engineers conducted two surveys of waterfowl at the southern end of Kivalina Lagoon 15 miles north of Portsite, one during September 2000 and a second during June 2001. The September survey was intended to observe southward migrating waterfowl that use lagoons and ponds in the south Kivalina Lagoon area, and the June survey was intended to observe all species of birds using this same area during the nesting season. No spectacled eiders were seen during these surveys.

Biologists from the National Science Center implanted transponder tags in 34 Alaskan and 30 Russian spectacled eiders from 1993 through 1996 (Peterson 1996). The movements of these tagged eiders were tracked by satellite. The study found molting areas at two locations in Russia and several molting areas in western and northwestern Alaska (Peterson et al. 1999). Waters in the vicinity of Portsite were not used by spectacled eiders.

Current sightings
There are no records of current sightings of spectacled eiders in the Portsite area.

Consequences of Alternatives on spectacled eiders.

The project alternatives for the Portsite are described in Chapter 2 of the DMT EIS. None of the Portsite alternatives are expected to adversely impact spectacled eiders or their habitat. There is little traditional knowledge of their presence in the immediate Portsite and Kivalina vicinity, and tagging studies suggest their migration is far offshore of the Portsite. Critical habitat for spectacled eiders is designated along the Chukchi Sea coast at Ledyard Bay and between Point Hope and Point Barrow. Few spectacled eiders are expected to be in the general portsite area, and fewer still are expected to be in the immediate Portsite area.

There are no known instances of spectacled eiders or any other seabirds or ducks colliding with structures or ships at the existing Portsite.

Assessment of Effects

Section 9 of the Act and Federal regulation pursuant to section 4(d) of the Act prohibits the taking of endangered and threatened species, respectively, without special exemption. A taking is defined as to harass, harm, pursue, hunt, shoot, wound, kill, trap, capture or collect, or to attempt to engage in any such conduct. Harm is further defined by the Service to include significant habitat modification or degradation that results in death or injury to listed species by significantly impairing essential behavioral patterns, including breeding, feeding, or sheltering. Harass is defined by the Service as intentional or negligent actions that create the likelihood of injury to listed species to such an extent as to significantly disrupt normal behavior patterns which include, but are not limited to, breeding, feeding, or sheltering. Incidental take is defined as take that is incidental to, and not the purpose of, the carrying out of an otherwise lawful activity. Under the terms of section 7(b)(4) and 7(o)(2), taking that is incidental to and not intended as part of an agency action is not considered to be prohibited taking under the Act provided that such taking is in compliance with the terms and conditions of an Incidental Take Statement determined by the Service.

Several alternatives are being considered for a Federal project at Portsite. The preferred alternative would be to construct a trestle from shore to a loading platform 1,450 feet offshore. The total length of the trestle, loading platform, and mooring dolphin would be 1,914 feet. The trestle would be 44 feet above the water at MLLW and be 142 feet in overall height. A channel about 3.5 miles long would be dredged to –53 feet MLLW between the loading platform and deep water about 4 miles offshore. Ships would access the loading platform through this channel.

Steller’s Eider
Steller’s eiders typically migrate offshore during spring and sightings of Steller’s eiders in the Portsite area are uncommon. We know from traditional knowledge that although

uncommon, Steller's eiders are occasionally seen in the Kivalina area. Our observations at Portsite confirm this traditional knowledge. The fall migration path of Steller's eiders is not well defined, but also likely takes place well offshore of Portsite.

Risk of Collision

The risk to Steller's eiders associated with the preferred Trestle-Channel alternative would be collision with the structure during foggy weather. Risk of collision would be relatively low because Steller's eiders rarely use airspace at Portsite, but collision during the 50-year life of the project is still a possibility. We believe that the risk of collision with the structures by Steller's eiders would be low because Steller's eiders are more apt to collide with objects during darkness, or because of attraction by lights. Daylight prevails during much of the day during the spring migration and attraction of birds to light is not expected to be a problem at Portsite.

Monitoring Collisions

There would be no effective way of monitoring or detecting actual collisions with a trestle unless it is witnessed or the body of the bird remains on the trestle and is recovered. Any bird colliding with the trestle and falling into the water would quickly drift away on currents, and foxes would quickly scavenge any bird that falls on the ice before breakup.

Potential Mitigation

Most collisions with structures by birds are the result of attraction to lights at night. Daylight would prevail almost 24 hours when Steller's eiders would be in the Arctic and attraction to lights on the trestle would be minimized as a result. None-the-less, lights on the trestle would be the downcast type intended to light only the work areas and minimize light scatter into the atmosphere.

Most birds have cones for reds, greens, and blues and are able to "see colors" in these spectrums of light. Painting the trestle a bright color that is visible to birds might mitigate the possibility of collision with the trestle during fog. Seals have only green cones and are essentially colorblind as a result. Painting the trestle a bright color would likely have no effect on seals basking near the trestle.

Conclusion

Based on the best scientific, empirical, and traditional ecological knowledge available, the Corps concludes that a potential for a small take of Steller's eider over the 50-year life of the proposed project exists, but that take caused by the project alternatives would not adversely jeopardize recovery of the species and is in compliance with the definition of take in Section 9 above. The Corps, therefore, believes that no adverse impact to Steller's eiders would result from the project alternatives.

Spectacled Eider

Spectacled eiders have reportedly used marine and lagoon habitats north of the existing portsite near Cape Thompson (Williamson, et al. 1966) and Cape Seppings (Erickson

1983), but none are known to use nearshore waters in the vicinity of the portsite. The spectacled eiders noted by Williamson (1966) and Erickson (1983) could have been non-breeding birds that are believed to gather in small flocks within their range (USFWS 2002). The world's population of spectacled eiders winters south of Saint Lawrence Island in the Bering Sea.

The migration timing and paths of spectacled eiders were discussed with Margaret Peterson, a noted spectacled eider biologist employed by the U. S. Geological Survey, Biological Resource Division (BRD). Studies of fall-migrating birds using satellite tags show that most of the Alaska Arctic Plain breeding population of spectacled eiders gathers in Ledyard Bay to molt before migrating directly across the Chukchi Sea to the northeast corner of the Chukotka Peninsula (M. Peterson personal communication). Little information is available on the route taken during the spring migration, but they likely return along the same general path they took during the fall migration. Regardless of the exact route spectacled eiders use for migration, apparently they are so far removed from the Portsite area that the proposed alternatives would not result in consequences for the species. The Corps concludes, therefore, that the alternatives proposed for the Portsite would not have an adverse effect on spectacled eiders.

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Appendix A

UNITED STATES DEPARTMENT OF COMMERCE
National Oceanic and Atmospheric Administration
National Marine Fisheries Service
P.O. Box 21668
Juneau, Alaska 99802-1668

Scanned

September 12, 2003

Guy McConnel
Chief, Environmental Section
U.S. Army Engineer District, Alaska
P.O. Box 6898
Elmendorf AFB, Alaska 99506-6898

Dear Mr. McConnel:

Thank you for your Biological Assessment of the impacts of the Delong Mountain Terminal on threatened or endangered species. Our agency concurs with your determinations regarding threatened and endangered species and their critical habitat, finding the proposed actions and alternatives were not likely to adversely affect the endangered bowhead whale. Therefore, we consider the requirements of section 7 (a)(2) of the Endangered Species Act have been met and no further consultation is required. Please direct any questions to Mr. Brad Smith in our Anchorage office, (907) 271-5006.

Sincerely,

Ronald J. Berg
Deputy Regional Administrator

ALASKA REGION - www.fakr.noaa.gov

United States Department of the Interior
Fish and Wildlife Service
Fairbanks Fish and Wildlife Field Office
101 12th Ave., Box 19, Room 110
Fairbanks, Alaska 99701
August 15, 2003

Lizette Boyer
U.S. Army Corps of Engineers
P.O. Box 6898
Elmendorf AFB, Alaska 99506

Re: Section 7 Consultation for DMT Portsite, Kivalina, AK

Dear Ms. Boyer:

This responds to your request dated August 14, 2003, for a formal effects determination pursuant to section 7 of the Endangered Species Act of 1973, as amended (Act). This information is being provided for the proposed expansion of the existing Delong Mountain Terminal (DMT) Portsite on the eastern Chukchi Sea coastline about 17 miles southwest of Kivalina and 80 miles northwest of Kotzebue, Alaska.

Although the proposed project site is within the breeding range of the threatened spectacled eider (*Somateria fischeri*), the habitat around the project site is of low quality for nesting so it is likely that spectacled eiders would only be found migrating through the project area. The Alaska breeding population of Steller's eiders (*Polysticta stelleri*), also listed as threatened, breeds and winters outside the range of the proposed projects, but also likely migrates through the area. Our principal concern with the proposed project is the potential for listed eiders to collide with the structures associated with Trestle-Channel Alternative during adverse weather conditions.

A Biological Assessment (BA) is required for "major construction activities" if listed species "may be present" in the action area regardless of the likelihood or significance of the effects. Because the proposed project is a "major construction activity" and listed species "may be present" in the action area, a BA or further Section 7 Consultation pursuant to Act is required with the Fish and Wildlife Service for the proposed activity. We concur with the Army Corps of Engineers's (ACE's) determination made on January 3, 2003 that the Trestle-Channel Alternative will adversely impact listed eiders. Should additional information on listed or proposed species become available, this determination may be reconsidered.

The formal consultation process for the project will not begin until we receive a complete BA and a letter from the ACE requesting initiation of formal consultation. It would be extremely helpful if the BA was as accurate and concise as possible. Knowing details about the proposed trestle/piers (lengths, heights, profiles, lighting regime, possible overhead wires, etc.) will be very

Ms. Lizette Boyer
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important in quantifying of impacts and estimate take of listed species. We will notify you when we receive this information; our notification letter will also outline the dates within which formal consultation should be complete and the biological opinion delivered on the proposed action.

This letter applies only to endangered and threatened species under our jurisdiction. It does not preclude the need to comply with other environmental legislation or regulations such as the Clean Water Act.

Thank you for your cooperation in meeting our joint responsibilities under the Act. If you need further assistance, please contact Jonathan Priday at (907) 456-0499.

Sincerely,

Ted Swem

Ted Swem
Branch Chief
Endangered Species

DRAFT BIOLOGICAL OPINION

INTRODUCTION

This document transmits the U.S. Fish and Wildlife Service's (Service's) draft biological opinion (BO) based on our review of the U.S. Army Corps of Engineers's (Corps') biological assessment (BA) for the proposed expansion of the existing DeLong Mountain Terminal (Portsite) facility located 17 miles southwest of Kivalina, Alaska, and its effects on Steller's eiders (*Polysticta stelleri*) and spectacled eiders (*Somateria fischeri*) in accordance with section 7 of the Endangered Species Act of 1973 (Act), as amended (16 U.S.C. 1531 et seq.). The Corps' August 28, 2003, request for formal consultation was received on September 8, 2003. On September 8, 2003, we sent a letter to the Corps stating that all information required to initiate consultation was either included with their initiation letter or is otherwise accessible for our consideration and reference. This letter also stated that since we had previously reviewed drafts of their biological assessment (BA) and sections of the Draft Environmental Impact Statement (DEIS), we hoped to deliver our final BO to the Corps prior to the 135-day statutory deadline. The Corps expects activities under the DEIS's Preferred Alternative to continue for 50 years. The proposed trestle/docking infrastructure is expected to operate at least 50 years. If significant new information becomes available before a new EIS is developed, the Corps should reinitiate consultation with the Service

The Portsite is within the breeding ranges of spectacled and Alaska-breeding Steller's eiders, both listed as threatened under the Act. We believe that the proposed action will likely adversely affect Alaska-breeding Steller's eiders and spectacled eiders that migrate from nesting areas on the Arctic Coastal Plain (ACP) through/by the Portsite. During spring migration, listed eiders fly along leads in the pack ice far offshore (median 15.3 km) and typically do not fly through the project area except under certain inclement weather conditions (Flint pers. comm., Bernard 1923). Limited telemetry data suggest that during fall migration listed eiders occasionally move through the Portsite area but do not utilize the area as a stopover or staging site (Martin 2003).

The following document assesses the effects of the proposed actions on the threatened spectacled eider and Steller's eider, in accordance with section 7 of the Act. This BO is based on information provided in the Corps' September 8, 2003, BA to evaluate the effects of proposed channel dredging and trestle construction/operation actions under the EIS's Preferred Alternative. The Corps' DEIS outlined 4 alternatives to implementing Portsite improvements that addressed the full range of the Corps' permitting/management responsibilities in the project area, with changes to the Portsite to allow increased shipping and ore loading as major focuses. Within the BA, the Corps identified the DEIS's Alternative A, the Trestle-Channel Alternative, as its Preferred Alternative. The Preferred Alternative includes activities that may adversely affect threatened spectacled and Steller's eiders from increased risk of collision to the proposed trestle/dock infrastructure. This impact will not likely adversely affect the behavior, distribution, and abundance of listed eider populations breeding on or adjacent to Alaska's Arctic Coastal Plain (ACP).

Based on the information provided on the proposed and potential activities, and the information currently available on listed and proposed species and designated and proposed critical habitat, the Service has determined that it is unlikely that the action will violate section 7(a)(2) of the Act. Section 7(a)(2) of the Act states that Federal agencies must ensure that their activities are not likely to: 1) jeopardize the continued existence of any listed species, or 2) result in the destruction or adverse modification of designated critical habitat. To arrive at this "non-jeopardy" determination, we used a five-step approach for applying the section 7(a)(2) standards. The steps are as follows:

1. Define the biological requirements and current status of each listed eider species,
2. Evaluate the relevance of the environmental baseline to the species' current status,
3. Determine the effects of the proposed or continuing action on listed species,
4. Determine whether the species can be expected to survive with an adequate potential for recovery under the effects of the proposed or continuing action, the effects of the environmental baseline, and any cumulative effects, and considering measures for survival and recovery specific to other life stages, and
5. Identify reasonable and prudent alternatives (RPAs) to a proposed or continuing action when that action is likely to jeopardize the continued existence of a listed species. Thus, this step is relevant only when the conclusion of the previously described analysis for Step 4, above, is that the proposed action would jeopardize listed species. The RPA would have to reduce the mortality associated with the proposed action to a level that does not jeopardize the species.

In addition to threatened Steller's and spectacled eiders, the project area may now or hereafter contain plants, animals, or their habitats determined to be threatened or endangered. The Service, through future consultation may recommend alternatives to dredging or ore loading/barging proposals to prevent activity that will contribute to a need to list such a species or their habitat. The Service may require alternatives to proposed activity that is likely to result in jeopardy to the continued existence of a proposed or listed threatened or endangered species or result in the destruction or adverse modification of a designated or proposed critical habitat. The Corps should not approve any activity that may affect any such species or critical habitat until it completes its obligations under applicable requirements of the Endangered Species Act as amended (16 U.S.C. 1531 et seq.), including completion of any required procedure for conference or consultation.

A chronology of consultation actions is provided in Appendix 1. A complete administrative record of this consultation is on file at the Fairbanks Fish and Wildlife Field Office, 101 12th Ave., Box 19, Fairbanks, Alaska 99701. If you have any comments or concerns regarding this BO, please contact Jonathan Priday, Endangered Species Biologist, Fairbanks Fish and Wildlife Field Office at 907/456-0499.

DESCRIPTION OF THE PROPOSED ACTION

Background

Section 7(a)(2) of the Endangered Species Act, (16 U.S.C. § 1531 et seq.), requires that each Federal agency shall insure that any action authorized, funded, or carried out by such agency is not likely to jeopardize the continued existence of any endangered species or threatened species or result in the destruction or adverse modification of critical habitat of such species. When the action of a Federal agency may adversely affect a protected species, that agency (i.e., the "action" agency) is required to consult with either the National Marine Fisheries Service (NMFS) or the U.S. Fish and Wildlife Service (Service), depending upon the protected species that may be affected. For the actions described in this document, the action agency is the Corps. Due to the protected species involved, the consulting agency is the Service. Section 7(b) of the Act requires that the consultation be summarized in a BO detailing how the action may affect protected species. The purpose of this BO is to fulfill the section 7 requirements for consultation on deep navigation improvements and trestle construction at the Portsite. Section 7 regulations allow a formal consultation to encompass a number of similar actions within a given geographic area or a segment of a comprehensive plan (50 CFR 402.14). This opinion focuses on the potential effects of the proposed Portsite expansion on the threatened Steller's eider (*Polysticta stelleri*) and spectacled eider (*Somateria fischeri*).

The Red Dog Mine, located in the DeLong Mountains approximately 84 miles north of Kotzebue, AK, is the largest zinc mine in the world. The mine, owned and operated by Teck Cominco Alaska, is located on land owned by NANA Corporation in the Northwest Arctic Borough. The Alaska Industrial Development and Export Authority (AIDEA) owns the DeLong Mountain Terminal (Portsite), also known as the port site, and the road connecting the mine with the Portsite. AIDEA contracts the operations at the Portsite to Teck Cominco.

An EIS was prepared by the Environmental Protection Agency (EPA) in 1984, prior to the construction of the mine. The existing facilities at the Red Dog Mine Site and Portsite were constructed in 1987-1988. Operations at the mine commenced in 1989 with the first shipments of ore from the Portsite in 1990. Teck Cominco currently operates the mine year round with an annual production of 1.1 million tons of zinc and 177,000 tons of lead concentrate. Concentrate is hauled from the mine site in 150-ton trucks via a 52-mile long road to the Portsite, located on the Chukchi Sea, where it is stored in two concentrate storage facilities. The concentrate is stockpiled and stored at the Portsite until early-July, when the marine ice pack has dissipated and the shipping season commences. Concentrate is currently loaded on to barges via a conveyor system and barged approximately 3 miles offshore to bulk carriers where it is loaded and shipped to international markets. During the open water season, July through November, the barge lightering system operates 24 hours a day until the storage facilities are empty. Thereafter, ore lightering and barging occurs at an on-demand basis until ice conditions prevent shipping through the Bering Straits.

In 1998, the U. S. Army Corps of Engineers began conducting environmental studies offshore of the existing port site to address the feasibility for deep draft navigation improvements at the Portsite. The Corps conducted scoping meetings in 2000 and is currently preparing a final EIS. On September 8, 2003, the Service received the Corps' final BA that identified their DEIS's Preferred Alternative. The Preferred Alternative selected was number 4 in the DEIS termed the Trestle-Channel Alternative.

The Trestle-Channel Alternative

The Portsite currently is composed of two concentrate storage facilities, three barge berths, fuel storage, accommodations for personnel, and a dock with covered conveyor system. The dock is approximately 700 feet long extending out to an approximate 20-foot water depth, with vessel draft limited to 15-17 feet. The dock is a trestle-style construction, with the base situated approximately 30 feet above the water. The top of the covered conveyor system is approximately 80 feet above the water.

The Trestle-Channel Alternative is the most complex of the alternatives considered and would require considerable engineering design and construction. A new trestle bridge and loading platform would be built to the north of the existing dock, thereby allowing for construction and continued operations at the barge loading facility. In addition, a deep-draft channel would be dredged to the new loading facility. Once complete, the new loading platform would allow for concentrate to be loaded directly into ships, eliminating the need for the lightering barges.

The trestle would be constructed using a series of cell and pile structures (Figure 1). The trestle would extend seaward 1,450 ft from an abutment on shore and would be 40 feet above mean water level (Figure 1). The average height of the trestle would be 142 feet above mean water level. The trestle structure would be supported by a conical pier foundation. The distance between piling clusters under the trestle would average 275 feet, but much closer under the platform. The trestle would support a conveyor system, a road, a fuel-transfer line, and utility lines from shore to the loading platform. The conveyor gallery approximately 8-foot high by 10-foot wide would be enclosed at the top of the structure. The conveyor would be enclosed to prevent fugitive dust from escaping to the outside environment.

At the seaward end of the trestle a 90-foot by 300-foot loading platform would be built to support two cranes, two radial ship-loaders, a conveyor tower, hydraulic rooms, and fuel unloading equipment. Ships docked at the trestle would average about 700 ft long. Tugs would assist the ships with docking. Because the ships will be much longer than the loading platform, a 164-foot catwalk would extend from the platform to a mooring dolphin seaward of the platform (Figure 1).

The trestle-channel alternative's fuel pipeline would be 12-inches diameter, allowing for direct discharge of fuel (up to13 million gallons) from tankers to the DMT port site. Currently, fuel is discharged from shallow-draft barges with a capacity of no more than 4 million gallons. Expected annual fuel deliveries at the Portsite would provide approximately

52.25 million gallons of fuel which would be stored at the port site tank farm. Approximately 30 million gallons of fuel would be available to be shipped to Northwest Arctic villages in shallow-draft tug and barge services.

The trestle and loading platform would have lights mounted along its roadway and working areas. One or more strobe lights would be mounted at high points on the trestle and platform. With exception of the strobes, lights on the trestle and on the platform would be "downcast" lights to light only the work area and to minimize light scatter into the atmosphere. Ships docked at the platform may have a higher profile than the highest points on the trestle or platform and would have lights and rigging of unknown types that are not determined by construction of a trestle at Portsite. Ships currently anchor and are loaded 3 miles offshore, but would load within 1/3 mile from shore after construction.

The Preferred Alternative also involves dredging a deep draft channel with a turning basin around the proposed platform. The channel would extend for approximately 19,700 ft and would be 500 ft at its narrowest and 1,600 ft at its widest. An estimated 6,200,000 $yards^3$ of material would be removed to construct the channel and basin. The estimated footprint would be 345 acres increasing to 414 acres over time due to slumping. Maintenance dredging of approximately 1.1 to 1.4 million $yards^3$ of sediment would have to occur at 5, 20, and 40-year intervals to maintain a 54 ft draft depth. All dredging would take place during the open water season.

The dredging of the channel and the deep-draft turning basin would be accomplished using one of, or a combination of, three dredges: a trailing suction hopper dredge; a hydraulic pipeline cutterhead; and a mechanical clamshell dredge. Each of the dredges have limitations according to the nature of the substrate and the depth of the water. All resulting dredging activity will result in an increase in turbidity within the marine environment.

Interrelated and Interdependent Actions

For this BO, the Service considered activities that would be interrelated and interdependent to the proposed action as well as accidental events that may occur as a result of the proposed action. Interrelated actions are those actions that are part of a larger action and depend on the larger action for their jurisdiction. Interdependent actions are those actions that have no independent utility apart from the action being considered in the BO. Interrelated and interdependent activities that may occur in NW Alaska in conjunction with the proposed action include additional mineral exploration/development on Native lands, additional telecommunications infrastructure, increased research activity, offshore oil exploration/development, onshore support facilities, additional staging areas, access roads, and accidental oil spills originating from barges, tank farms, and supply vessels.

STATUS OF THE SPECIES

Steller's eider

The Alaska-breeding population of Steller's eider was listed as threatened on June 11, 1997 (Federal Register 62(112): 31748- 31757). This action was based on a substantial decrease in the species' nesting range in Alaska, a reduction in the number of Steller's eiders nesting in Alaska, and the resulting increased vulnerability of the remaining breeding population to extirpation. Historically, Steller's eiders nested in Alaska in two general regions: western Alaska, where the species has been nearly extirpated, and the North Slope, where the species still occurs. In western Alaska, Steller's eiders occurred primarily in the coastal fringe of the Yukon-Kuskokwim Delta, where the species was common at some sites in the 1920s, was still present in the 1960s, but was not recorded as breeding from 1976-1994 (Kertell 1991, Flint and Herzog 1999). In 1994,1996-1998, and 2002, 1-2 nests were found at either or both the Tutakoke River and Hock Slough study sites on the Yukon-Kuskokwim Delta (Flint and Herzog 1999).

On the North Slope, Steller's eiders historically occurred from Wainwright east, nearly to the United States-Canada border (Brooks 1915). The species may have abandoned the eastern North Slope in recent decades, but it still occurs at low densities from Wainwright to at least as far east as Prudhoe Bay. The majority of sightings in the last decade have occurred east of Point Lay, west of Nuiqsut on the Colville River, and within 90 km (56 miles) of the coast. Near Barrow, Steller's eiders still occur regularly, though they do not nest annually. In some years, up to several dozen pairs may breed in a few square kilometers.

Aerial breeding pair surveys conducted in late June indicate a population of about 1200 birds (Mallek 2001). A separate aerial survey, timed in mid-June, indicates a smaller population, averaging about 150 birds from 1992-2003 (Larned et al. 2003). Both surveys likely underestimate actual population size, however, because an unknown proportion of birds are missed when counting from aircraft, and no species-specific correction factor has been developed and applied. Nonetheless, these observations indicate that hundreds or low thousands of Steller's eiders occur on the North Slope. These surveys do not demonstrate a significant population trend over the last decade. However, based on the observed interannual variability, it is estimated that it would take 14 years to detect a trend equivalent to a 50% change over 10 years (Larned et al. 2001a). Thus, current sampling intensity is too low to provide useful trend detection over short time intervals for this very rare species. There is some support for the belief that Steller's eiders have abandoned formerly occupied areas and have reduced their breeding frequency in eastern portions of the North Slope; if true, this suggests that the Alaska-breeding population has declined on the North Slope in recent decades (Quakenbush et al. 2002).

Steller's eiders spend most of the year in marine habitats. During winter, most Steller's eiders concentrate along the Alaska Peninsula from the eastern Aleutian Islands to southern Cook Inlet in shallow, near-shore marine waters (Jones 1965, Petersen 1980). They also occur in the western Aleutian Islands and along the Pacific coast, occasionally to British

Columbia, along the Asian coast (from the Commander Islands to the Kuril Islands), and some are found along the north Siberian coast west to the Baltic States and Scandinavia (Cramp et al. 1977). In spring, large numbers concentrate in Bristol Bay before migration. In 1992, an estimated 138,000 Steller's eiders congregated there before sea ice conditions allowed movement northward (Larned et al. 1994). Spring migration of Alaska-breeding birds typically involves small flocks following offshore ice leads north through the Bering Strait as early as mid-May and reaching Pt. Barrow by early June. In contrast, southerly migration begins in mid-July with brood-rearing females and broods leaving nesting areas from late August to mid-September. Anecdotal information suggests that Steller's eiders migrate south in small flocks along the coast.

Steller's eiders arrive in pairs on the North Slope in early June. Nesting effort varies widely from year to year. In the13 years from 1991-2003, there were 6 "nesting years" (1991, 1993, 1995, 1996, 1999, 2000) when typical breeding activities occurred, and 6 "non-nesting years" (1992, 1994, 1998, 2001, 2002, 2003) when birds appeared in early summer, but no nests were found and Steller's eiders are believed not to have nested (Quakenbush et al. 1995, Obritschkewitsch et al. 2001, Service, unpublished data). Four nests were found in 1997, but these were initiated late (early July) and none survived past mid-incubation (Service and NSB, unpublished data). The reasons for the observed variation in nesting effort are unknown, but an association has been noted between nesting years and years of lemming abundance. Nest success could be enhanced in years of lemming abundance because predators are less likely to prey on eider nests when small mammals are abundant. It has also been hypothesized that avian predators such as pomarine jaegers (*Stercorarius pomarinus*) and snowy owls (*Nyctea scandiaca*), which nest at high densities only when lemmings are abundant, may provide protection for nearby eider nests incidental to defense of their nesting territories (Quakenbush and Suydam 1999). If this hypothesis is correct, the presence of avian predators is an essential element of breeding habitat.

In nesting years, initiation dates are typically in the first half of June (Quakenbush et al. 1995), and hatching dates range from 7 July to 3 August (Quakenbush et al. 1998). Nests in Barrow are located in wet tundra, in areas of low-center polygons or low (indistinct flat-centered) polygons, frequently within drained lake basins (Quakenbush et al. 1998). Average clutch sizes at Barrow ranged from 5.3-6.3 in five different years, with clutches up to 8 reported (Quakenbush et al. 1995). Nest success (proportion of nests at which at least 1 egg hatched) at Barrow averaged approximately 17% from 1991-2002 (Service, unpublished data). Egg loss was attributed mostly to predation by predators, including jaegers, common ravens (*Corvus corax*), and possibly glaucous gulls (*Larus hyperboreus*) and arctic foxes (*Alopex lagopus*) (Quakenbush et al. 1995, Obritschkewitsch et al. 2001). The fledging period is not known, but is estimated to be 37 days (Obritschkewitsch et al. 2001). Broods most often used ponds with emergent grass (*Arctophila fulva*) (Quakenbush et al. 1998). Broods were reared close to their nest site; 8 broods tracked near Barrow in 1995 remained within 650 meters of their nest sites during the first 32 days after hatching (Quakenbush et al. 1998).

Males typically depart the breeding grounds after females begin incubating. Based on observations in the Barrow area, and on a small sample of birds equipped with satellite transmitters, males depart Barrow around the end of June or early July (Quakenbush et al. 1995, Obritschkewitsch et al. 2001, Service, unpublished data). Both males and females tracked with satellite transmitters in a non-breeding year dispersed across the area between Wainwright and Admiralty Inlet in late June and early July, with most birds entering marine waters by the first week of July. The satellite-tracked birds used coastal locations from Barrow to Cape Lisburne, and made extensive use of lagoons and bays on the north coast of Chukotka (Service, unpublished data). Visual observations in other years confirm the use of nearshore areas of the Chukchi Sea; small groups of males (less than 10) have been observed in July near Barrow (Service, unpublished data). Females that fail in breeding attempts may remain near Barrow later in the summer; a single failed-breeding female equipped with a transmitter in 2000 remained near the breeding site until the end of July, and stayed in the Beaufort Sea off Barrow until late August. Females and fledged young depart the breeding grounds in early to mid-September.

In mid-August, Alaska-breeding Steller's eiders migrate to molting areas, where they congregate in large flocks in protected waters. Concentrations of molting Steller's eiders have been noted in Russia on the Chukchi and Bering seacoasts, near Saint Lawrence Island in the Bering Sea, and along the northern shore of the Alaska Peninsula (Kistchinski 1973, Fay 1961, Jones 1965, Petersen 1981). Satellite-tracked birds from Barrow molted at Nunivak Island, Cape Avinof (Kuskokwim Shoals), Nelson Lagoon/Port Moller, and Izembek Lagoon (Service, unpublished data).

On January 10, 2001, the Service designated 2,830 mi^2 of critical habitat for Steller's eiders at breeding areas on the Yukon-Kuskokwim Delta, staging area in the Kuskokwim Shoals, and molting areas in waters associated with the Seal Islands, Nelson Lagoon, and Izembek Lagoon. Although the Service believes some portion of the North Slope is essential for the conservation of the species and therefore meets the definition of critical habitat, critical habitat has not been designated on the North Slope. The Act provides that an area essential to the conservation of listed species can be excluded from critical habitat designation if the benefits of excluding the area outweigh the benefits of designating the area as critical habitat, provided that exclusion does not result in the extinction of the species. The Service believes that there are few, if any, benefits of designating critical habitat on the North Slope at this time. Federal agencies already consult with us on activities they are associated with on the North Slope. Our experience with these consultations is that it is unlikely that critical habitat designation will change their outcome. Moreover, those wishing to carry out activities on the North Slope are already aware of the importance of the North Slope to breeding Steller's eiders, so there is no informational benefit of designating critical habitat. There are disadvantages of designating critical habitat on the North Slope. We believe that some portion, though not all, of the North Slope is essential to the conservation of Steller's eiders, yet the available information does not allow us to discern which specific areas should be designated as critical habitat. While a subset of the North Slope could be designated as critical habitat, we believe that to designate such an area without a more reliable biological basis would convey an inaccurate message about the size and location needed for recovery and may undermine ongoing cooperative efforts to carry out conservation efforts.

Causes of suspected population declines are not known. Possible causes of decline in the Barrow area include artificial increases in predator populations, subsistence harvest and ingestion of lead shot. In 2003, a Recovery Plan was finalized by the Service that provided strategies to recover the Alaska-breeding population of Steller's Eiders to the point that protection under the Act is no longer required (i.e., "delisting" is appropriate). Interim objectives identified were: 1) to prevent further declines of the Alaska-breeding population (including both the northern and western Alaska subpopulations); 2) to protect Alaska-breeding Steller's Eiders and their habitats; 3) to identify and alleviate causes of decline and/or obstacles to recovery; and 4) to determine size, trends, and distribution of the northern and western Alaska-breeding subpopulations. The Recovery Plan also outlined tasks as being high priority actions needed to achieve the ultimate and interim objectives listed above. The tasks include: 1) reduce exposure to lead; 2) reduce nest predation; 3) reduce hunting and shooting mortality; 4) elucidate distribution and abundance; 5) acquire information on marine ecology; 6) acquire information on breeding ecology; 7) acquire demographic information needed for population modeling efforts; 8) maintain or re-establish subpopulation on Yukon-Kuskokwim Delta; and 9) develop partnerships for recovery efforts.

Spectacled eider

The spectacled eider was listed as a threatened species under the Act in May 1993. Currently, primary nesting grounds are the Yukon-Kuskokwim Delta, the North Slope (Cape Simpson to the Sagavanirktok River) of Alaska, and in the Chaun Gulf and the Kolyma, Indigirka, and Yana river deltas of arctic Russia. Post-breeding flocks of staging and molting spectacled eiders have been observed in Mechigmenan Bay (on the eastern coast of Russia's Chukotsk Peninsula), Alaska's Ledyard Bay (southwest of Point Lay), Peard Bay, Norton Sound, and 80 km south of Saint Lawrence Island. An estimated 7,149 spectacled eiders occupied the Arctic Coastal Plain of Alaska in June 2003 (Larned et al. 2003), about 2% of the estimated 375,000 world population (Larned and Tiplady 1999).

From late December to early April, the only known wintering area of spectacled eiders is within leads in the pack ice southwest of St. Lawrence Island in the Bering Sea (Larned et al. 1997, Petersen et al. 1999). Leads in ocean ice are important pathways for marine bird and mammal species migrating along the Beaufort Sea coast in Alaska and Canada. All species of eiders use this lead system, typically flying at altitudes less than 30 meters (Johnson and Richardson 1982). During spring migration spectacled eiders migrate offshore along the Bering (median 15.3 km), Beaufort (median 6.6 km for males, 16.6 km for females), and Chukchi (median 34.9 km) Sea coasts (P. Flint pers. comm.). Very little is known about migratory routes east of Barrow because the definitive lead system transforms into numerous branches varying in location and extent from year-to-year. Because few spectacled eiders are observed in marine areas along the Beaufort coast in spring, a majority may migrate to nesting areas overland from the Chukchi Sea (TERA 2003). Migration of eiders (the majority of which are king and common eiders) along Alaska's northern coast has been described in several studies (Thompson and Person 1963, Johnson 1971, Woodby and Divoky 1982). Spectacled eiders are observed in mixed flocks of king, common, and sometimes Steller's eiders, but the proportion of both spectacled and is quite small. Although information specific to listed eider flight behavior is lacking, a spectacled eider was seen striking a utility wire near an electric light in white-out conditions on St. Lawrence Island in 1998 (Service, unpublished data). In summer 2003, 4 dead/injured spectacled eiders were retrieved by the Service that likely collided with overhead power lines/guy wires (3 at Barrow and 1 at Prudhoe Bay) (Service, unpublished data).

Spectacled eiders arrive on North Slope breeding grounds paired, often in small flocks, in late May to early June. Spectacled eiders nest mainly from the Sagavanirktok River to the Chukchi Sea, and only sparsely to the east (Larned et al. 2001a). Based on Service aerial surveys (1998-2002, Arctic Coastal Plain east to the Arctic National Wildlife Refuge), the highest densities were found south of Barrow, with smaller areas of concentration east of Teshekpuk Lake, on the Colville River Delta, and near western Simpson Lagoon. Overall density was estimated to be 0.22 birds per square kilometer in 2002 (Larned et al. 2002).

Male spectacled eiders begin to depart breeding areas during incubation, which is during late June on the North Slope. On the North Slope, pair numbers peak in mid-June and the number of males declines 4-5 days later (Smith et al. 1994, Anderson and Cooper 1994, Anderson et al. 1995). Following their late June departure from the nesting areas, males apparently make little use of the Beaufort before migrating to the Chukchi Sea. During late June the Beaufort Sea has little open water, hence males present at breeding grounds east of Barrow normally do not use marine habitats and fly directly overland (most heading to a molting/staging area in Ledyard Bay) (TERA 2003). Later in the season (late June through September), when females depart the North Slope, much more of the nearshore zone is ice-free. Open water in marine habitat allows for extensive use of the western Beaufort Sea. Radio telemetry studies have shown that most female spectacled eiders that migrate west toward Barrow use the nearshore zone of the Beaufort Sea as they transit to their molting/staging areas. In 2000,13 female spectacled eiders tracked via radio telemetry primarily used the western Beaufort (71% of all bird-days) while areas near Stockton Island were also extensively used (17% of all bird-days) (TERA 2003). The females remained in the Beaufort Sea nearshore zone for an average of about two weeks (range 6-30 days).

Predators of spectacled eider eggs include gulls, jaegers, and foxes. In arctic Russia, apparent nest success has been calculated to be as low as <2% in 1994 and 27% in 1995; foxes, gulls, and jaegers are suspected to have depredated most of the nests (Pearce et al. 1998). On Kigigak Island in the Yukon-Kuskokwim Delta, nest success ranged from 20-95% in 1991-1995 (Harwood and Moran 1993, Moran and Harwood 1994, Moran 1995, Moran 1996). Nest success may have been higher in 1992 than in other years of observation, because foxes were eliminated from the island prior to the nesting season that year. Apparent nest success in 1991 and 1993-1995 in the Kuparuk and Prudhoe Bay oil fields on the North Slope ranged from 25-40%(Warnock and Troy 1992, Anderson et al. 1998).

Spectacled eider incubation lasts 20-25 days (Dau 1974, Kondratev and Zadorina 1992, Harwood and Moran 1993, Moran and Harwood 1994, Moran 1995). Average clutch sizes on the North Slope average 3.2-3.8, with clutches up to 8 reported (Quakenbush et al. 1995, Troy pers. comm.). Hatching on the North Slope occurs from mid- to late July (Warnock and Troy 1992). Fledging occurs approximately 50 days after hatching. At this time, females with broods move directly from freshwater to marine habitats (Dau 1974, Kistchinski and Flint 1974).

On the nesting grounds, spectacled eiders feed by dabbling in shallow freshwater or brackish ponds, or on flooded tundra (Dau 1974, Kistchinski and Flint 1974). Food items include mollusks, insect larvae such as Tipulidae (craneflies), trichopterans (caddisflies), and chironomids (midges); small, freshwater crustaceans, and plants or seeds (Cottam 1939, Dau 1974, Kistchinski and Flint 1974, Kondratev and Zadorina 1992). Spectacled eiders in the marine environment feed predominately on clams and small amounts of snails, amphipods, and other bivalves. In March-April 1999 and 2001, studies within the spectacled eider wintering areas showed that the esophagi of collected eiders contained only clams, almost entirely *Nuculana radiata* with no trace of the once dominant and preferred *Macoma calcarea* (Lovvorn 2002). Changes in the density of *Macoma calcarea* in the Bering Sea are coincident with an oceanic regime shift to warmer conditions in 1976-77 (Lovvorn et al. 2002 review). Exceptional climate change in the arctic and subarctic, and associated changes in marine communities and ice dynamics in spring, may have had important impacts on spectacled eiders.

The range-wide population of spectacled eiders is estimated at 375,000 (Larned and Tiplady 1999). From the early 1970s to the early 1990s, numbers of pairs on the Y-K Delta declined by 96% from 48,000 to 2,000, apparently stabilizing at that low level (Stehn et al. 1993, Petersen et al. 1999). This dramatic decline on the Y-K Delta was the primary reason the species was listed as threatened in 1993. On the North Slope, however, trends in population size are much less clear. Abundance indices from North Slope eider surveys in 1993-2003 do not show a statistically significant trend (Larned et al. 2001b, Larned et al. 2003), and data from prior to 1993 are not suitable for trend analysis.

Factors known or suspected to affect survival of spectacled eiders have been identified but the relative importance of these factors to the species' decline and recovery are not known. The extent and causes of population decline are difficult to assess because historical data are lacking for many locations. Several of the following factors are known to affect survival during the nesting season, but it is not clear whether they contributed to the decline of the spectacled eider population.

Lead poisoning is a confirmed cause of mortality of eiders that ingested lead shot on the breeding grounds in the Yukon-Kuskokwim Delta. Spent shot pellets are eaten, either as grit or by eiders foraging in sediments for food. The grinding action of the eider's gizzard, in combination with the acidic environment of its digestive tract, causes toxic lead salts to be released into the body. The proportion of spectacled eiders on the Y-K Delta's lower Kashunuk River drainage that contained lead shot in their gizzards is high (11.6%, n=112) compared to other waterfowl in the lower 48 states from 1938-1954 (8.7%, n=5088) and from 1977-1979 (8.0%, n=12,880). The lead exposure rate in spectacled eiders (based on X-rays) is likely biased low (Flint et al. 1997), because lead is retained in the gizzard for only about three weeks (Elder 1954, Dieter and Finley 1978, Anderson and Havera 1986, Franson 1986, Anderson et al. 1987). Blood analyses of spectacled eiders indicate elevated levels of lead in 13% of pre-nesting females, 25.3% of females during hatch, and 35.8% during brood rearing. Nine of 43 spectacled eider broods (20.9%) contained one or more ducklings exposed to lead by 30 days after hatch (Flint et al. 1997). Spent lead shot in the lower Kashunuk River area and on Kigigak Island is causing additive mortality in spectacled eiders, that is, mortality over and above that caused by natural circumstances (Grand et al. 2003). It is possible that exposure to lead occurs in small, localized hunting areas on the North Slope as well, however, there are no site-specific data on lead contamination in this region.

Predation pressure on spectacled eider eggs, young, and adults may have increased in recent decades. Predators include arctic foxes (*Alopex lagopus*), red foxes (*Vulpes fulva*), large gulls (*Larus* spp.), jaegers (*Stercorarius* spp.), and snowy owls (*Nyctea scandiaca*). Native elders on the North Slope believe that fox numbers have increased in recent decades as a result of reduced trapping. Wastes made available from the commercial fishing industry in the Bering Sea and North Pacific, along with an increase in the garbage generated by coastal communities, have increased the year-round food supply for gulls. Glaucous gull populations could have increased in response to an increased food supply. However, a recent analysis of three aerial survey data sets revealed no clear evidence of an increase in North Slope gull numbers since the 1970's, although an increase of less than 100 percent would not have been detectable using this analysis (L. Noel, Entrix, pers. comm.).

Subsistence harvest of spectacled eider eggs and adults is another potential factor in the decline of the spectacled eider population. Alaska Natives have traditionally harvested eiders and their eggs in coastal villages during spring and fall. Subsistence harvest surveys for the North Slope indicate that an average of 155 spectacled eiders were taken at Wainwright during1988-1989 and only 2 spectacled eiders were reported taken at Barrow during 1987-1990 (Braund et al. 1993). Yup'ik Eskimos on the Y-K Delta have traditionally harvested spectacled eiders for subsistence purposes (Klein 1966). Although the human population on the Y-K Delta has grown substantially, changes in the numbers of active hunters are unknown. Similarly, available harvest technologies have become increasingly efficient, but the actual effects of new technologies on harvest levels are unknown. The estimated harvest of spectacled eiders on the Y-K Delta from 1992-95 averaged 272 birds/year (Service, unpublished data); the 1992-2001 average is 123 birds/year (Service, unpublished data).

There are other sources of take such as avicultural egg collecting (until 1991), disturbance from research activity, and loss of habitat in growing communities and oilfields. Their overall impacts to the spectacled eider population is unknown.

Other potential factors that may affect spectacled eider survival have been suggested but not investigated. These include changes in the invertebrate community structure in their winter habitats, bioaccumulation of contaminants in the marine environment, human harvest for sport and subsistence outside their breeding grounds, disease, parasites, and accidental strikes and/or disturbance of benthic feeding areas by commercial fishing activity.

In 1996, a Recovery Plan was finalized by the Service that provided strategies to recover the Alaska-breeding spectacled eiders to the point that protection under the Act is no longer required (i.e., “delisting” is appropriate). Objectives identified were: 1) prevent further declines of the Alaska-breeding population (including both the northern and western Alaska subpopulations); 2) determine size, trends, and distribution of the northern and western Alaska-breeding subpopulations; 3) investigate population dynamics by conducting population viability analysis (PVA); 4) determine if population declines and/or reproductive failures result from accumulation of environmental contaminants; 5) investigate the habitats used and prey items selected by foraging spectacled eiders away from breeding grounds; 6) assess the contribution of subsistence harvest to population trends; 7) investigate whether predator-prey relationships can account for population declines; 8) determine genetic profile of 3 major populations; and 9) collect data on the impacts of diseases and parasites.

On January 10, 2001, the Service designated 38,991 mi^2 of critical habitat for spectacled eiders at molting areas in Norton Sound and Ledyard Bay, breeding areas in central and southern Yukon-Kuskokwim Delta, and wintering area in waters south of St. Lawrence Island. Although the Service believes some portion of the North Slope is essential for the conservation of the species and therefore meets the definition of critical habitat, we did not designate critical habitat on the North Slope. The Act provides that an area essential to the conservation of listed species can be excluded from critical habitat designation if the benefits of excluding the area outweigh the benefits of designating the area as critical habitat, provided that exclusion does not result in the extinction of the species. The Service believes that there are few, if any, benefits of designating critical habitat on the North Slope at this time. Federal agencies already consult with us on activities they are associated with on the North Slope. Our experience with these consultations is that it is unlikely that critical habitat designation will change their outcome. Moreover, those wishing to carry out activities on the North Slope are already aware of the importance of the North Slope to breeding spectacled eiders, so there is no informational benefit of designating critical habitat. There are disadvantages of designating critical habitat on the North Slope. We believe that some portion, though not all, of the North Slope is essential to the conservation of spectacled eiders, yet the available information does not allow us to discern which specific areas should be designated as critical habitat. While a subset of the North Slope could be designated as critical habitat, we believe that to designate such an area without a more reliable biological basis would convey an inaccurate message about the size and location needed for recovery and may undermine ongoing cooperative efforts to carry out conservation efforts

ENVIRONMENTAL BASELINE

Regulations implementing the ESA (50 CFR §402.2) define the environmental baseline as the past and present impacts of all Federal, State, or private actions and other human activities in the action area. Also included in the environmental baseline are the anticipated impacts of all proposed Federal projects in the action area that have undergone section 7 consultation, and the impacts of State and private actions which are contemporaneous with the consultation in progress.

<u>Status of Spectacled eiders and Steller's eiders within the action area</u>

Alaska-breeding Steller's eiders and North Slope-breeding spectacled eiders likely migrate through/by the Portsite on route to breeding grounds on the North Slope (Stehn and Platte 2000, Childs 1969, Service unpublished). During spring migration, listed eiders fly along leads in the pack ice far offshore (median 15.3 km) (Flint pers. comm.). Typically small flocks of Alaska-breeding birds follow these offshore ice leads north through the Bering Strait as early as mid-May and reach North Slope breeding grounds by early June. We believe Steller's and spectacled eiders likely do not fly through the project area during spring migration except under certain inclement weather conditions (Flint pers. comm., Bernard 1923, Williamson et al. 1966). The Corps believes that strong southwest winds were responsible for surveyors observing of 4 small flocks of up to 35 Steller's eiders at the Portsite during the spring of 2000. In contrast, southerly migration begins in mid-July with brood-rearing females and broods leaving nesting areas from late August to mid-September. Anecdotal information suggests that listed eiders migrate south in small flocks along the coast, therefore possibly passing by the Portsite.

According to traditional knowledge on Steller's and spectacled eiders collected at Kivalina (17 miles north of the Portsite), both species rarely pass through the area (Georgette 2000). Surveys done during spring, summer and fall prior to construction of the existing Portsite found no spectacled or Steller's eiders (Erickson and 1983). Informal bird surveys done in summer and fall of 2000 and 2001 found no spectacled or Steller's eiders migrating through the project area. Limited telemetry data also suggest that the project area is not used by either species as a stop over or staging area during fall migration (Service unpublished, Peterson et al. 1999, Peterson, pers. comm.). However, Steller's eiders have been recorded stopping over at sites immediately north and south of the Portsite such as Point Hope, Cape Thompson, Cape Seppings and Cape Espenberg (1-3 days) (Service unpublished, Childs 1969). Both species are essentially absent from the action area from October to May (Larned et al. 2003).

Although a 2003 spring migration survey estimated 77,329 Steller's eiders (both Russian and Alaska-breeding birds), the highest estimate since1998, the 1992-2003 trend indicates a 6.1 percent annual population decline (Larned 2003). No migration surveys have been done for North Slope-breeding spectacled eiders. However, it is possible to infer migration numbers/trends from the 2003 breeding pair survey done on the North Slope (7149 birds/decreasing trend), but it is uncertain how/if any of these birds actually move through the project area (Larned et al. 2003). Furthermore, the factors that limit the Alaska-breeding population have not been identified. Therefore, it is difficult to determine whether human activity and habitat alteration have affected the status of the species migrating through the Portsite. However, factors that may have affected the status of the species in the project area include collisions with Portsite structures, disturbance from research efforts, and subsistence harvest.

Factors affecting species environment within the action area

Global warming appears to be influencing widespread alterations in the Bering Sea's food web. Although spectacled eider population trends in Siberia, and on the North Slope before 1993, are unknown, the decline of spectacled eiders on the Y-K Delta appears roughly concurrent with long-term trends in the Bering Sea benthos (Lovorn et al. 2003). Studies begun in the mid-1980's have shown declines in the biomass per square meter and mean sizes of clams that are the spectacled eider's primary forage during the winter (Grebmeier and Dunton 2000). These observations have raised questions about effects of benthic changes on the winter diet of spectacled eiders and their late-winter body condition because for common eiders (*S. mollissima*) many females do not nest in years when feeding conditions on wintering areas are depressed (Coulson 1984). It is unknown whether the decline of Alaska-breeding Steller's eiders corresponds to changes in Bering Sea benthos.

Coastal habitats in Northwestern Alaska have remained largely unaltered and uninhabited by humans. A small portion of the species' northwest migratory corridors around the Seward Peninsula have been impacted by commercial fishing, shipping and mining operations. These activities typically produce varying levels of noise/disturbance during the open water season. Annual sealifts to Coastal Villages and shipping activities at the Portsite are currently the only sources of industrial activity in Northwestern Alaska between Nome and Barrow.

Over the last decade strides in the affordability of wind turbine and cellular phone technology have led to explosive growth in the numbers of towers lining the species' migration corridor. Migrating Steller's and spectacled eiders are at risk of collision with objects in their path, such as towers, particularly when visibility is impaired during darkness or inclement weather, such as rain, drizzle, or fog (Weir 1976). The incidence of bird strikes appears to rise when objects are illuminated with constant diffuse light, and the tendency for birds to be drawn to diffuse light appears to increase during rainy or foggy weather. Its been reported that 88% of eiders flew below an estimated altitude of 10 m (32 ft) and well over half flew below 5 m (16 ft) (Johnson and Richardson 1982). Although information specific to listed eider flight behavior is lacking, a spectacled eider was seen striking a utility wire near an electric light in white-out conditions on St. Lawrence Island in 1998 (Service, unpublished data). Accidental strikes of unidentified eiders in Northwest Alaska have been reported in association with the Bering Sea crab fishery and guyed towers in Nome, presumably influenced by bright lights (Service, unpublished).

Lead or other sources of contamination of habitat or prey species are possible in localized areas within the Northwest migration corridor of Steller's and spectacled eiders. Listed eiders may swallow lead shot pellets when they probe the bottom for food, mistaking them for food items such as mollusks (small snails or clams) and insects or grit. While on breeding grounds, listed eiders typically dig in the bottom of lakes and ponds for their food and are therefore at great risk for lead contamination. Although ingestion of lead is thought to take place primarily on the breeding grounds, exposure in marine molting, stopover and wintering areas has not been definitively excluded. Exposure of waterfowl to lead has been documented in the range of both spectacled eiders and the Alaska-breeding population of Steller's eiders. Elevated blood and tissue lead levels, morbidity, and mortality from lead poisoning were found in spectacled and common eiders (*Somateria fischeri* and *S. mollissima*, respectively) on the Yukon-Kuskokwim Delta (Franson et al. 1995, Flint et al. 1997, Flint and Herzog 1999). On breeding grounds near Barrow, one Steller's eider found dead in June had liver and kidney lead concentrations suggestive of lead poisoning, although several other Steller's eiders examined at the same time of year had lower lead tissue concentrations (Trust et al. 1997, Service, unpublished). Blood samples from nesting hens trapped near Barrow in 1999 and 2000 showed that all (8 of 8) had concentrations exceeding the clinical threshold for lead exposure and 7 of 8 exceeded thresholds for lead poisoning in waterfowl.

Sport hunting for Steller's and spectacled eiders was closed in 1991 by Alaska State regulations and Service policy. Outreach efforts have been conducted by the Service to inform hunters of these closures. In 2003, a spring subsistence hunting season for migratory birds in Alaska was proposed. Although, killing listed eiders is not permitted by the spring hunting regulations, many hunters cannot identify birds on the wing and will likely mistake their quarry killing prohibited species. An ESA consultation for this spring subsistence hunt was completed in May 2003 and adverse impacts identified in the BO are considered here and will be considered in future consultations concerning listed eiders in Alaska. Accurate information on current harvest rates is not available, but hunter surveys and other observations indicate that both intentional and unintentional shooting of Steller's and spectacled eiders likely continues in Northwest Alaska (Paige et al. 1996, Georgette 2000, Wentworth 2001).

Research efforts unrelated to listed eiders also may result in impacts within the action area. Because ore moving through the Portsite has high concentrations of heavy metals, the Alaska Department of Environmental Conservation (ADEC), U.S. Environmental Protection Agency (EPA), and the National Park Service (NPS) have ongoing field research and monitoring regimes in place. Field research typically occurs during the summer months, but numbers, locations, and type of activities remain speculative because data has not been collected that quantifies these activities in/near the Portsite. Through section 7 processes, the Service will continue providing project applicants with recommendations and restrictions intended to minimize impacts of associated research on listed eiders. Estimating impacts from field research is difficult because despite section 7 requirements that field researchers consult with the Service, many researchers are unaware of the requirement and hence never consult. Our experience tells us that individual research projects typically don't have impacts that result in take. However, without a greater understanding of the extent of research activities around the Portsite, it is difficult to determine whether the cumulative effects of field research may result in take.

All of the factors discussed here may have influenced populations of threatened spectacled and Steller's eiders in northern Alaska, although it is unknown if these factors played a major role in either species' decline.

EFFECTS OF THE ACTION ON LISTED SPECIES

Collisions with Trestle Infrastructure

Migrating birds are at risk of collision with objects in their path, particularly when visibility is impaired during darkness or inclement weather, such as rain, drizzle, or fog (Weir 1976). The incidence of bird strikes appears to rise when objects are illuminated with constant diffuse light, and the tendency for birds to be drawn to diffuse light appears to increase during rainy or foggy weather. Accidental strikes of "hundreds" of unidentified eiders were reported to have occurred in association with the Bering Sea crab fishery, presumably influenced by the bright lights used on fishing vessels (Service, unpublished). Comparisons have shown that blinking lights cause less mortality than constant lighting, and the color of the lights and the object may influence collision frequency (Weir 1976). Cross-sectional area also affects the number of birds that strike an obstruction.

Its been reported that 88% of eiders flew below an estimated altitude of 10 m (32 ft) and well over half flew below 5 m (16 ft) (Johnson and Richardson 1982). Although information specific to listed eider flight behavior is lacking, a spectacled eider was seen striking a utility wire near an electric light in white-out conditions on St. Lawrence Island in 1998 (Service, unpublished data). In September-October 2001, several sea duck fatal collisions were documented at Northstar Island and the Endicott oil production facility on the North Slope. In 2001, 36 birds were retrieved at Northstar Island and Endicott, all sea ducks, including 5 king eiders, 23 common eiders, and 8 long-tailed ducks (Service, unpublished data). In 2002, 3 long-tailed duck fatalities resulted from platform strikes at Northstar. To date for 2003, 3 common eiders and 2 long-tailed duck fatalities were recorded at Northstar, 5 common eiders have fatally collided with Endicott, and 4 dead/injured spectacled eiders have been retrieved by the Service that likely collided with overhead power lines/ guy wires (3 at Barrow and 1 at Prudhoe Bay) (Service, unpublished data). The densities of Steller's and spectacled eiders migrating past the Portsite are much lower than those of the species typically found dead at Northstar Island. Therefore, the potential for them striking the proposed trestle structure is much lower.

Because listed eiders migrate through the Portsite either on route to breeding grounds or when returning to molting/staging areas, the proposed trestle/dock structures may pose collision risks to listed eiders. Although the total profile of trestle/dock structure is anticipated to be small relative to the species' migration corridor, the Service believes that the proposed structures pose a risk to migrating threatened eiders because: 1) the Portsite is located along routes used by threatened eiders (Alaska breeding populations) migrating north and south to and from breeding grounds on the North Slope (Johnson and Richardson 1982, Service unpublished); 2) the artificial lighting associated with the trestle, ships and associated infrastructure may serve as a magnet to migrants, particularly during episodes of fog, rain and snow (Weir 1976); and 3) the flight altitude of migrating eiders is low and within the height range of the trestle and docked ships.

Some listed eiders likely migrate through the project area on route to breeding grounds on the North Slope or returning to molting/wintering areas. Therefore, based on our understanding of the biology of the species, their migration routes, distribution, behavior, and collision data from Northstar/Endicott, we believe that there is some risk of injury or death of individuals from collisions with the trestle, docked ships and associated infrastructure. However, the Preferred Alternative includes 2 measures that seek to mitigate this risk. One measure is a requirement for the use of downcast lights that will illuminate work areas while minimizing light scatter into the atmosphere. Another measure requires minimizing the use of hanging cables. Also, we believe that the majority of listed eiders migrate offshore of the Portiste and would not encounter the proposed infrastructure. Therefore, the best available scientific and commercial information does not lead us to believe that significant population-level impacts are likely to result from collisions with the proposed infrastructure.

CUMULATIVE EFFECTS

Cumulative effects include future State, local or private actions that are reasonably certain to occur in/adjacent to the action area considered in this BO. Future Federal actions that are unrelated to the proposed action are not considered in this section because they require separate consultation pursuant to section 7 of the Act. Due to the large amount of wetlands (under Corps oversight), surface/subsurface lands under Federal management, and Native governments in Northwest Alaska, most land use activities have a federal nexus through required federal permits or federal funding and are therefore not analyzed here.

When analyzing cumulative effects of a proposed action it is important to define spatial boundaries (geographical), temporal boundaries and types of actions that are reasonably foreseeable within the spatial and temporal boundaries. For this analysis, the spatial boundary is Northwest Alaska and associated near shore waters of the Chukchi Sea (State waters). We define Northwest Alaska here as all drainage basins from Cape Prince of Wales on the Seward Peninsula north to Barrow that empty into the Chukchi Sea. Northwest Alaska can typically be divided into 3 major regions: the ACP, the Foothills and the Brooks Range. Most of Northwest Alaska's surface/subsurface lands are managed by the Federal Government, State of Alaska and Native Corporations (very little private ownership). To date, all mineral extraction has occurred in the Brooks Range, but there is increasing interest/exploration in the foothills and ACP. The only area directly influenced by industrial mineral extraction activity on the ACP is the corridor from the Red Dog Mine to the Portsite which crosses the Cape Krusenstern National Monument.

For this analysis, the temporal boundaries are January 1, 2006, to January 1, 2056 (50 years). Under the DEIS's Preferred Alternative, the Corps expects construction to begin in 2006 and run through 2007 while ore lightering/loading will continue for 50 years.

Generally, future State, and local government actions are likely to be in the form of legislation, administrative rules, or policy initiatives. Government and private actions may include changes in land use patterns, including ownership, zoning and intensity, any of which could affect listed eiders or their habitat. Even actions that are already authorized are subject to political, legislative, and fiscal uncertainties. These realities, added to the geographic scope of the action area, which encompasses numerous government entities exercising various authorities and split-estate lands, make any analysis of cumulative effects difficult. Therefore, these issues are addressed in a summary way below.

State Actions

State of Alaska actions reasonably certain to occur within/adjacent to the North Slope over the next 50 years include: oil, gas and hard rock mineral leasing, exploration, development, and production; support facility construction, road construction/maintenance, telecommunication infrastructure construction, pipeline/transport facility construction. Over the past 2 decades the State of Alaska has proposed areawide oil and gas lease sales in the Chukchi Sea. For instance, in 1992 the State of Alaska proposed leasing 840,000 acres of state-owned tide and submerged lands in the Chukchi Sea in the vicinity of Kasegaluk Lagoon. We anticipate that future State oil and gas lease sales will be held once oil/transportation infrastructure eventually extends into NW NPR-A making development more economic. However, future State of Alaska oil and gas activities will be subject to Federal permitting requirements because these actions would likely occur in wetlands and/or nearshore areas requiring authorizations under the Clean Water Act and Rivers and Harbors Act. Therefore, because Federal approval requires section 7 consultation, the Service does not incorporate these State actions into the cumulative effects analysis.

Local Government Actions

Local and regional government actions reasonably certain to occur within/adjacent to Northwest Alaska through 2058 include: oil, gas and hard rock mineral lease sales, exploration, development, and production; gravel mining, support facility construction, road construction, pipeline/transport facility construction, telecommunication infrastructure construction, land reconveyances from Native corporations to private individuals, subsistence harvest activities, marine shipping, field research, tourism, Village growth and conservation work. Of these actions only marine shipping, field research, tourism, Village growth and conservation work may lack a Federal nexus. However, except for Village growth, the Service is not aware of any specific future non-Federal activities in Northwest Alaska that would cause greater impacts to listed eider tan present occurs.

The Service assumes that local governments will be faced with continuing pressures from economic and population growth and movement. There will be demands for intensified development in rural areas, as well as increased demands for water, municipal infrastructure, and subsistence resources. The reaction of local governments to growth and population pressure is difficult to assess without certainty in policy and funding. In the past, local governments in Northwest Alaska generally accommodated growth in ways that adversely affected listed eider habitat. For instance as Barrow and Wainwright have grown over the last decade, several acres of known high-density Steller's eider nesting habitat have been lost. However, today the Service and several local governments have positive working relationships and often work together to strike a delicate balance between conserving listed eiders and ongoing Village growth. For instance, local governments are working collaboratively with the Service to develop a conservation plan aimed at providing a greater opportunity for recovery of listed eiders, while accommodating an increasing human population (Barrow Conservation Plan).

Private Actions
Data quantifying current private activity in Northwest Alaska does not exist, therefore projecting future private actions and corresponding impacts to listed eiders is extremely difficult. Private actions reasonably certain to occur within/adjacent to Northwest Alaska that may impact listed eiders through 2058 include: subsistence activities, land use changes, continued accumulation and persistence of lead shot in the environment, and loss of breeding habitat due to off-road vehicle use. Private landowners may convert their lands from current uses, or they may intensify or diminish those uses. Individual landowners may voluntarily initiate actions to improve habitat, or they may abandon or resist any improvement efforts. Their actions may be compelled by new laws, or they may result from growth and economic pressures. Changes in ownership patterns will have unknown impacts. Whether any of these private actions will occur is highly unpredictable, and the effects even more so. However, due to the miniscule amount of privately held land held in Northwest Alaska, any corresponding impacts to listed eiders from changes in surface activities on those lands are assumed to be minimal.

In summary, non-Federal actions are likely to continue affecting listed eiders in Northwest Alaska. Cumulative effects in Northwest Alaska are difficult to analyze, considering the Area's broad geographic landscape, geographic and political variation, the uncertainties associated with government and private actions, and ongoing changes in the region's economy. Whether those effects will increase or decrease in the future is a matter of speculation; however, based on the population and growth trends identified in the Local Government subsection, cumulative effects are likely to increase. Although local governments are developing plans and initiatives, such as the Barrow Conservation Plan, which may mitigate impacts from increased local activity, these must be ratified and applied in a comprehensive manner before the Service can consider them "reasonably foreseeable" in an analysis of cumulative effects.

CONCLUSION

After reviewing the proposed action, current status of spectacled and Steller's eiders, environmental baseline for the action area, effects of the proposed action, and cumulative effects, it is the Service's biological opinion that actions outlined within the Corps' BA and Draft EIS, as proposed, are not likely to jeopardize the continued existence of the spectacled and Steller's eider, and is not likely to destroy or adversely modify designated critical habitat. Critical habitat for spectacled eiders has been designated in Northwest Alaska at Ledyard Bay, however, this action does not affect that area and no destruction or adverse modification of that critical habitat is anticipated. There is no designated or proposed critical habitat in Northwest Alaska for Steller's eiders.

Regulations (51 FR 19958) that implement section 7(a)(2) of the Act define "jeopardize the continued existence of" as "to engage in an action that reasonably would be expected, directly or indirectly, to reduce appreciably the likelihood of both the survival and recovery of a listed species in the wild by reducing the reproduction, numbers, or distribution of that species." In evaluating the impacts of the proposed draft EIS to Steller's and spectacled eiders, the Service identified that direct impacts could result, such as collisions with the proposed trestle/dock infrastructure by migrants. However, the Service believes that these impacts to spectacled and Steller's eiders will be minimal for the reasons given in the *Effects of the Action* section of this BO.

Using methods and logic explained in the Incidental Take Statement (which follows this BO), the Service estimates that 18 adult spectacled eiders will be taken during the life of the proposed project. Across the 50-year life of the project, this equates to an average of 0.36 adults spectacled eiders taken per year. Thus, on average, less than 0.01% of the adult breeding population will be taken as a result of this project (assuming a breeding population size of 6919 adults. The Service believes that this level of loss will not significantly affect the likelihood of survival and recovery of the spectacled eider.

It should be noted that for the purposes of determining jeopardy/non-jeopardy for this consultation, the impacts to spectacled eiders were evaluated at the scale of the North Slope breeding population. However, the impacts of the proposed project would also not jeopardize the survival and recovery of the larger global population.

Using methods and logic explained in the Incidental Take Statement, the Service estimates that 3 adult Steller's eiders will be taken during the life of the proposed project. Across the 50-year life of the project, this equates to an average of 0.06 adult Steller's eiders taken per year. Thus, on average, less than 0.01% of the adult breeding population will be taken per year as a result of this project (assuming a breeding population size of 1250 adults). The Service believes that this level of loss will not significantly affect the likelihood of survival and recovery of the Alaska-breeding population of the Steller's eider.

INCIDENTAL TAKE STATEMENT

Section 9 of the Act and Federal regulations pursuant to section 4(d) of the Act prohibit the take of endangered and threatened species, respectively, without special exemption. Take is defined as to harass, harm, pursue, hunt, shoot, wound, kill, trap, capture or collect, or attempt to engage in any such conduct. "Harm" is further defined by the Service to include significant habitat modification or degradation that results in death or injury to listed species by significantly impairing essential behavioral patterns, including breeding, feeding, or sheltering. "Harass" is defined by the Service as intentional or negligent actions that create the likelihood of injury to listed species to such an extent as to significantly disrupt normal behavior patterns which include, but are not limited to, breeding, feeding or sheltering. Incidental take is defined as take that is incidental to, and not the purpose of, the carrying out of an otherwise lawful activity. Under the terms of section 7(b)(4) and section 7(o)(2), taking that is incidental to and not intended as part of the agency action is not considered a prohibited taking provided that such taking is in compliance with the terms and conditions of this Incidental Take Statement (ITS).

The measures described below are non-discretionary, and must be undertaken/required by the Corps so that they become binding conditions of any grant or permit issued to an applicant, as appropriate, for the exemption in section 7(o)(2) to apply. The Corps has a continuing duty to regulate the activity covered by this Incidental Take Statement. If the Corps (1) fails to assume and implement the terms and conditions or (2) fails to require any applicant to adhere to the terms and conditions of the Incidental Take Statement through enforceable terms that are added to the permit or grant document, the protective coverage of section 7(o)(2) may lapse. In order to monitor the impact of incidental take, the Corps should report the progress of the action and its impact on the species to the Service as specified in the *Terms and Conditions* section of this BO [50 CFR 402.14(i)(3)].

Collisions with Drilling Structures and Associated Infrastructure

The Service anticipates that some threatened spectacled and/or Steller's eiders may collide with the proposed trestle, platform and/or associated docking infrastructure at the Portsite. Such losses likely will not affect the North Slope populations of spectacled and Steller's eiders. However, limited information available on spectacled and Steller's eider migration routes, behavior, and vulnerability to obstructions when migrating complicates estimating anticipated collisions. However, the anticipated footprint of the proposed trestle, platform and associated docking infrastructure is likely to be relatively small within listed eider migration corridors and we believe the majority of eiders encountering platforms during migration are likely to miss or avoid the obstructions.

Estimating the number of Steller's and spectacled eider fatal collisions is extremely difficult due to a lack of available information on sea duck strikes and the effectiveness of the Corps' proposed structure lighting regimes. Limited data is available for common eider (*Somateria mollissima*) strikes to Northstar Island, which is located north of Prudhoe Bay in the Beaufort Sea Outer Continental Shelf (OCS) (560 meter north/south profile). From this data it is possible to extrapolate a strike rate for sea ducks per structure-year by dividing the number of common eider strikes (6) to Northstar Island in 2002 by the most recent population estimate of common eiders migrating west over the Beaufort Sea (111,635) (Suydam et al. 1996, Service, unpublished). That number is then multiplied by the North Slope population estimates for spectacled (6,919) and Steller's eiders (1,250) (Larned et al. 2001a, Larned et al. 2003, Mallek 2001) to give a "strikes per 560 meters of obstruction/year" estimate for both species. The results of this imprecise methodology estimate that 0.37 spectacled and 0.07 Steller's eiders will fatally collide with each 560 meters of horizontal profile of the proposed structure per year.

The Corps' BA states that the proposed 533 m x 27 m trestle/platform structure would operate over a 50 year period. Since the proposed trestle structure has less horizontal profile than Northstar (533 m vs. 560 m), to generate a strike rate for the Portsite one must adjust for the size difference (533/560 x Northstar strike rate = Portsite strike rate). When the proposed years of operation are multiplied by the strike rates generated using the method outlined above, we initially estimate 18 spectacled and 3 Steller's eider will die from collisions with the proposed trestle/dock structure over the life of the project. However, the Preferred Alternative requires structures that are potential collision hazards to implement marking/lighting regimes in order to reduce collision risk. It has been documented that marked spans of overhead wires resulted in 60% fewer collisions when compared to the same spans prior to marking (Alonso et al. 1994). The lighting regime proposed within the BA is not described in enough detail to allow us to quantitatively estimate the reduction in fatal collisions that may result. However, it is reasonable that the Corps' commitment to light the proposed structures will result in fewer listed eiders colliding with the proposed infrastructure than if a conventional lighting regime were installed. Hence, for the purposes of this ITS we believe that our estimate that 18 spectacled and 3 Steller's eider will die from collisions with the trestle, platform and associated structures over the life of the proposed action is conservative.

It is important to note that the above estimates for fatal collisions to the proposed trestle, platform and associated structures are imprecise. The estimates do not take into consideration that eider strikes are episodic in nature, most spectacled and Steller's eiders never migrate through the Portsite area, that the Portsite has longer days further into the fall migration period than Northstar (better visibility), that marking and lighting of rigs/structures may not be effective and that the strike rates are generated from only one year of data at a single location in the Beaufort Sea. Therefore, as more data on eider strikes to obstructions in Alaska becomes available, it may be necessary to reinitiate consultation if observed strike rates are higher than estimated for this analysis.

Conclusion

In conclusion, the Service anticipates the proposed action will likely result in the take of 18 spectacled eiders and 3 Steller's eiders as a result of fatal collisions with Portsite structures. The take is expected to be in the form of killing. The Service has determined that this level of anticipated killing is not likely to result in jeopardy to the species or destruction or adverse modification of critical habitat.

While the incidental take statement provided in this consultation satisfies the requirements of the Act, as amended, it does not constitute an exemption from the prohibitions of take of listed migratory birds under the more restrictive provisions of the Migratory Bird Treaty Act.

However, the Service will not refer the incidental take of any migratory bird or bald eagle for prosecution under the Migratory Bird Treaty Act of 1918, as amended (16 U.S.C. §§ 703-712), or the Bald and Golden Eagle Protection Act of 1940, as amended (16 U.S.C. §§ 668-668d), if such take is in compliance with the terms and conditions (including amount and/or number) specified herein.

REASONABLE AND PRUDENT MEASURES

The Service believes that the following reasonable and prudent measures are necessary and appropriate to minimize take of Steller's and spectacled eiders:

1. To minimize the likelihood that migrating spectacled or Steller's eiders will strike trestle, platform and associated docking infrastructure at the Portsite, the Corps and the Service will cooperatively develop a lighting/marking protocol intended to reduce radiation of light outward from structures and to increase the visibility of structures to migrating eiders.

2. To record take of listed eiders resulting from collisions to the proposed infrastructure, a mechanism must be developed and installed to contain birds that strike structures extending over water.

Terms and Conditions

In order to be exempt from the prohibitions of Section 9 of the Act, the Corps must comply with the following terms and conditions, which implement the reasonable and prudent measures described above and outline required reporting/monitoring requirements. These terms and conditions are non-discretionary.

1. To minimize the likelihood that migrating spectacled or Steller's eiders will strike structures associated with docking and ore loading activities, the Corps and Service will cooperatively develop a lighting/operating protocol to be used on all trestle, platform and associated docking structures. The Service and the Corps will work together to identify when and where the protocol should be applied. Any protocol developed will be in compliance with Federal Aviation Administration (FAA) regulations. The lighting protocol shall contain the following 2 components:

> A. The radiation of light outward from all trestle, platform and associated ore loading structures will be minimized. This will be achieved by shading and/or light fixture placement to direct light inward and downward to living and work surfaces while minimizing light radiating upward and outward.
>
> B. Structures will be lighted and/or marked to improve visibility to migrants according to a strategy to be jointly developed by the Corps and the Service.

1) This strategy will be developed using available information on bird avoidance measures including, but not limited to, results of the ongoing study of lighting regimes for Northstar Island being conducted by BP Alaska, ABR, Inc., and the Service.

2) A draft strategy will be provided by the Service to Corps by 31 May 2005; the final strategy must be mutually agreed upon by the Corps and Service by 1 April 2006, or a later date that is mutually agreed upon.

3) This strategy applies to all proposed Portsite structures after September 1, 2004, because mitigation measures that provide unequivocal benefits are not available at this time.

4) Any lighting requirements resulting from this strategy need not apply between November 31 and May 1, because listed eiders are not thought to be migrating by the Portsite during this period.

5) This strategy will be modified, as appropriate, if significant new information on bird avoidance measures becomes available during activities covered by this consultation. Modifications to the strategy will be developed jointly by the Corps and the Service.

2. A catchment system should be designed and installed along the length of both sides of all infrastructure extending over water. The system should be monitored daily for birds. Bird strikes should be reported to the Service, including the species, date, weather conditions, and location along the infrastructure where the bird was recovered.

The Service believes that no more than 18 spectacled eiders and 3 Steller's eider will be incidentally taken during the life of the proposed project. The reasonable and prudent measures, with their implementing terms and conditions, are designed to minimize the impact of incidental take that might otherwise result from the proposed action. If, during the course of the action, this level of incidental take is exceeded, such incidental take represents new information requiring reinitiation of consultation and review of the reasonable and prudent measure provided. The Federal action agency must immediately provide an explanation of the causes of the take and review with the Service the need for possible modification of the reasonable and prudent measure. If Steller's and/or spectacled eiders are encountered injured or killed through collisions with the proposed structures, please contact the Fairbanks Fish and Wildlife Field Office, Endangered Species Branch, Fairbanks, Alaska at (907) 456-0499 for instruction on the handling and disposal of the injured or dead bird.

CONSERVATION RECOMMENDATIONS

Section 7(a)(1) of the Act directs Federal agencies to utilize their authorities to further the purposes of the Act by carrying out conservation programs for the benefit of endangered and threatened species. Conservation recommendations are discretionary agency activities to minimize or avoid adverse effects of a proposed action on listed species or critical habitat, to help implement recovery plans, or to develop information. We recommend the following actions be implemented during the leasing and exploration phase of this lease sale:

1. The Corps, in cooperation with the applicant, are encouraged to contribute to ongoing migration surveys and satellite telemetry efforts for threatened eiders and other species of concern that utilize or migrate through the action area. Monitoring/survey results will allow the Service and the Corps to better evaluate abundance, distribution, and population trends of listed eiders and other species of concern throughout Western and Arctic Alaska. These results will enhance the Service's and Corps' ability to ensure future activities at the Portsite will not jeopardize listed eiders or lead to listing additional species.

2. The Corps and applicant are encouraged to work with the Service and other Federal and State agencies in implementing recovery actions identified in the spectacled and Steller's eider recovery plans. Research to determine important habitats, migration routes, and wintering areas of spectacled and Steller's eiders would be an important step toward minimizing conflicts with current and future Portsite activities.

3. A radar study to monitor the movement of birds along the Portsite during spring and fall migration should be conducted pre- and post construction of the proposed infrastructure. The study should examine the efficacy of the lighting system used on the proposed infrastructure, and the effects of changing the system, particularly if bird collisions become a problem. The study should be conducted for a minimum of 5 years post-construction, with annual updates and a final report provided to the Service.

Additional conservation recommendations may be proposed during subsequent consultations on Portsite activities. In order for the Service to be kept informed of actions minimizing or avoiding adverse effects or benefiting listed species or their habitats, the Service would appreciate notification of the implementation of any conservation recommendations.

REINITIATION NOTICE

This concludes formal consultation on the actions outlined in the Corps' initiation letter received August 23, 2003. As provided in 50 CFR 402.16, initiation of formal consultation is required where discretionary Federal agency involvement or control over the action has been retained (or is authorized by law) and if: 1) the amount or extent of incidental take is exceeded; 2) new information reveals effects of the action agency that may affect listed species or critical habitat in a manner or to an extent not considered in this opinion; 3) the agency action is subsequently modified in a manner that causes an effect to listed or critical habitat not considered in this opinion; or 4) a new species is listed or critical habitat designated that may be affected by the action. In instances where the amount or extent of incidental take is exceeded, any operations causing such take must cease pending reinitiation. The Corps should also reinitiate consultation if it becomes evident that any additional development or activity not described in their BA may take place without separate consultation on that action.

Thank you for your concern for endangered species and for your cooperation in the development of this biological opinion. If you have any comments or require additional information, please contact Jonathan Priday at (907) 456-0499 with the Fairbanks Fish and Wildlife Field Office, Endangered Species Branch, Fairbanks, Alaska.

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APPENDIX 1

Red Dog Mine/Portsite Expansion Consultation History

01/02/03 - The Corps forwards FFWFO a draft BA

01/14/03 - FFWFO contacts the Corps to note that their BA did not include a project description, a full description of all the alternatives, or a preferred alternative. FFWFO informs the Corps that they can't initiate consultation for the proposed project without this crucial information (informal or formal).

03/01/03 - FFWFO contacts the Corps again to note that they have still not received a project description, a full description of all the alternatives, or a preferred alternative. FFWFO informs the Corps that they can't initiate consultation for the proposed project without this crucial information (informal or formal).

03/03/03 - The Corps contacts FFWFO to explain that they have been avalanched with details and lost track of where they were. They state that they are working on a description of the alternatives and will forward a draft as soon as one is available.

03/19/03 - The Corps forwards FFWFO portions of the draft EIS.

03/26/03 - FFWFO contact the Corps to inform them that formal consultation will be required for their Portsite expansion project.

08/14/03 - The Corps contacts FFWFO requesting a formal effects determination.

08/14/03 - FFWFO sends a letter to the Corps requesting a finalized Biological Assessment. FFWFO states that the formal consultation process for the proposed project will not begin until they receive a complete BA and a letter from the ACE requesting initiation of formal consultation.

08/15/03 - Corps transmits final Biological Assessment to FFWFO for review.

09/08/03 - FFWFO sends a letter to the Corps confirming receipt of their August 28, 2003, letter requesting initiation of formal section 7 consultation. FFWFO states that information required to initiate consultation was either included with the Corps' letter or is otherwise accessible for our consideration and reference. FFWFO assigns log number OS-2003_077 to this consultation.

11/17/03 - FFWFO contacts the Corps to explain that they have identified several information gaps in the BA concerning the Preferred Alternative. FFWFO requests a copy of the draft EIS to supplement the BA.

11/17/03 - The Corps states that a complete draft EIS is not available for distribution. The Corps states that they will look for an introduction/background section and e-mail FFWFO what they can find.

11/19/03 - Corps contacts FFWFO stating that they sent some draft in-house DMT EIS chapters but they were returned undeliverable.

11/20/03 - Corps contacts FFWFO stating that they will resend portions of the draft EIS via email tomorrow (11/21/03).

11/21/03 - Corps states that they have emailed zipped versions of the draft EIS. FFWFO never receives emailed draft. FFWFO contacts the Corps to ask them to try resending the document in a different format.

01/08/04 - FFWFO completes draft BO and circulates it for internal review.

01/13/04 - FFWFO transmits draft BO to the Corps for review.