BIOLOGICAL OPINION
The Effects of Constructing a New Addition to the Harbor in Sand Point, Alaska, on the Threatened Steller's Eider (*Polysticta stelleri*)

DESCRIPTION OF PROPOSED ACTION

The Aleutians East Borough and City of Sand Point, in coordination with the U.S. Army Corps of Engineers (COE), propose to construct an addition to the boat harbor near Black Point in Humboldt Harbor, Popof Strait, Sand Point, Alaska, 55º 20' north latitude, 160º 30' west longitude, Sec 8 T56S, R73W, SM (COE 2000a).

Sand Point is a commercial fishing community on the northwestern shore of Popof Island in the Shumagin Island group off the southwestern Alaska Peninsula. Fishing vessels mooring at Sand Point, Alaska, are in excess of the current harbor's capacity (COE 2000a). Moorage demand requires additional space for vessels 24.4 to 48.8 meters (80 to 160 feet) in length. An analysis of the existing and projected demand at Sand Point determined additional moorage space for 63 commercial fishing vessels greater than 24.4 meters (80 feet) in length is needed. Of these vessels, 21 are seeking permanent spaces and 42 are seeking transient spaces. Optimization of the harbor plan determined that net benefits are maximized with 37 slips.

Vessels use Sand Point facilities to obtain provisions, for crew rotations, for moorage during closed fishing periods, and for protection during adverse weather conditions. Excess demand for harbor services and facilities, especially for transient vessels over 24.4 meters (80 feet) in length, occurs during peak periods. Overcrowded harbors increase the likelihood of vessel damage, personal injury, and fire. Commercial enterprises that depend on harbor facilities and services experience inefficiencies and, ultimately, loss of income when a harbor does not run smoothly because of overcrowding.

Harbor improvements constructed at Black Point will have a footprint of 7.4 hectares (18.3 acres) (COE 1998). The entrance channel, mooring basin, and fairway will be about 4.7 hectares (11.6 acres). Approximately 60,246 cubic meters (78,800 cubic yards) of material will be dredged from 2.9 hectares (7.25 acres). The basin will be dredged to a design depth of 5.2 meters (-17 feet) mean lower low water (MLLW) and the entrance channel to 5.5 meters (-18 feet) MLLW. Dredging will likely be done by a clamshell dredge and excavator; however, the actual method will be up to the contractor. In-water blasting of rock [4,128 cubic meters (5,400 cubic yards)] is expected. The side slopes of the entrance channel will be stabilized by roughly 2,102 cubic meters (2,750 cubic yards) of armor rock.

The dredged material will be discharged along the shoreline of the new basin to construct a 1.1-hectare (2.7-acre) storage/access area. Storage/access areas are an integral part of harbor design and are required to support harbor-related activities. The area's topography limits the siting of a storage/access area adjacent to the proposed basin. The high tide line reaches the base of the hillside and storage areas will be constructed by dredging and filling intertidal areas. After creation of the 1.1-hectare (2.7-acre) storage/access area, remaining material will be discharged along the shoreline of the existing harbor or within the proposed harbor at depths in excess of 6.1 meters (-20 feet) MLLW.

Based on conditions at the existing harbor and an evaluation of the littoral transport process in the area, maintenance dredging at the Black Point site is expected to be rather minimal. Since the existing harbor was constructed in 1976, it has only been dredged once [about 625 cubic meters (817 cubic yards) in 1993]. An estimated 765 cubic meters (1,000 cubic yards) of material will need to be removed by maintenance dredging every 18 years.

STATUS OF THE SPECIES

Species Description

The 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 the eiders. 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

Steller's eiders are long lived, with individuals known to have lived at least as long as 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, pers. comm. 2000).

Energetics

Goudie and Ankney (1986) suggest that small-bodied sea ducks such as harlequin (*Histrionicus histrionicus*) and long-tailed ducks (*Clangula hyemalis*) that winter at northern latitudes do so near the limits of their energetic threshold. These species have little flexibility in regards to caloric consumption or on their opportunity to rely on caloric reserves. Under this life history strategy, such species are vulnerable to perturbations within their winter habitat. Because the Steller's eider is relatively small-bodied, being intermediate in size to the harlequin and long-tailed ducks (Bellrose 1980), and because it overlaps with harlequins and long-tailed ducks in its choice of foraging areas and prey items, the species may, like the harlequin and long-tailed ducks, exist near its energetic limits. Unlike other larger eiders, Steller's eiders must continue to feed upon reaching their nesting areas, to build up enough energy reserves to breed (D. Solovieva, pers. comm. 2000). In addition, female Steller's eiders must continue to feed during incubation. Spectacled eiders, a larger bodied sea duck, apparently do not exist so close to their energetic threshold; they arrive on the nesting grounds fit enough to fast through egg laying and incubation.

Age to Maturity

Sexual maturity is believed to be deferred to the second year (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. The length of time that Steller's eiders remain paired is unknown. However, long-term pair bonds have been documented in other ducks (Bengtson 1972, Savard 1985, as in Cooke et al. 2000).

Pairs of Steller's eiders arrive at Point Barrow as early as June 5 (Bent 1987). While nesting, Steller's eiders often occupy shallow coastal wetlands in association with tundra (Bent 1987, Quakenbush et al. 1995, Solovieva 1997), although we have records of aerial observations of Steller's eider pairs well inland on the Arctic Coastal Plain. This species establishes nests near shallow ponds or lakes, usually close to water.

Clutch size has been reported to range from 2 to 10 eggs (Bent 1987, Bellrose 1980, Quakenbush et al. 1995). The average clutch size of successful nests near Barrow is reported as 4.6 (n = 8). Solovieva (1997) found that clutch size for Steller's eiders on the Lena Delta varied between five and eight eggs with an average of 6.1 (n = 32). Nesting success near Barrow (percent of nests where eggs hatch) is variable (Quakenbush et al., 1995). In 1991, five of six nests hatched while in 1993, only four of 20 nests hatched.

During some years, the species apparently does not even attempt to nest near Barrow (Quakenbush et al., 1995).

Recruitment

Steller's eider recruitment rate (the percentage of fledged birds that reach sexual maturity) is unknown. However, there is limited information regarding Steller's eider fledging rate. Near Barrow, 83.3 percent (five of six) of Steller's eiders nests with eggs hatched in 1991, 20.0 percent (four of 20) hatched in 1993 (Quakenbush et al. 1995), and 15 percent (three of 20) hatched in 2000 (Philip Martin, Service, pers. comm.). In other years, Steller's eiders did not even attempt to breed near Barrow (Quakenbush et al. 1995). We conclude that the annual recruitment rate for this species is likely variable.

Seasonal Distribution Patterns

<u>Banded and Satellite-Tagged Alaskan Breeding Birds</u>: Little is known of the distribution of Alaska breeding Steller's eiders outside of the breeding season. A few band recoveries indicate that birds that breed near Barrow undergo molt in Izembek lagoon. A satellite telemetry study was initiated in 2000 to investigate the molting and wintering locations of the Alaskan population of Steller's eiders. Satellite transmitters were placed on four Steller's eiders captured in Barrow. Two Steller's eiders (one male and one female) spent the molting season on the Kuskokwim shoals, while a third (a male) molted near the Seal Islands (Philip Martin, Service, pers. comm.). Both birds that molted at Kuskokwim Shoals moved on to the Hook Bay portion of Bechevin Bay in November. The male remained in Hook Bay at least until late December when his transmitter stopped working. The female remained at Hook Bay until early February, at which time she returned to Izembeck Lagoon and remained there into spring. The bird that molted near the Seal Islands moved west to Nelson Lagoon in October. After spending approximately three weeks at Nelson Lagoon, this bird moved west to Sanak Island at the end of November. The bird remained at Sanak Island for three months. During this time his use area was small, only a few square kilometers. By March 4, he had moved back Izembek Lagoon in the vicinity of his November locations (Philip Martin, Service, pers. comm.).

<u>Breeding Distribution</u>: The exact historical breeding range of the Alaska-breeding population of Steller's eiders is not clear. The historical breeding range may have extended discontinuously from the eastern Aleutian Islands to the western and northern Alaska coasts, possibly as far east as the Canadian border. In more recent times, breeding occurred in two general areas, the Arctic Coastal Plain, and western Alaska, primarily on the Y-K Delta. Currently, Steller's eiders breed on the western Arctic Coastal Plain in northern Alaska, from approximately Point Lay east to Prudhoe Bay, and in extremely low numbers on the Y-K Delta.

On the Arctic Coastal Plain, anecdotal historical records indicate that the species occurred from Wainwright east, nearly to the Alaska-Canada border (Anderson 1913; Brooks 1915). There are very few nesting records from the eastern Arctic Coastal Plain, however, so it is unknown if the species commonly nested there or not. Currently, the species predominantly breeds on the western Arctic Coastal Plain, in the northern half of the National Petroleum Reserve - Alaska (NPR-A). The majority of sightings in the last decade have occurred east of the mouth of the Utukok River, west of the Colville River, and within 90 km (56 mi) of the coast. Within this extensive area, Steller's eiders generally breed at very low densities.

The Steller's eider was considered a locally "common" breeder in the intertidal, central Y-K Delta by naturalists early in the 1900s (Murie 1924; Conover 1926; Gillham 1941; Brandt 1943), but the bird was reported to breed in only a few locations. By the 1960s or 70s, the species had become extremely rare on the Y-K Delta, and only six nests have been found in the 1990s (Flint and Herzog 1999). One to two nests continue to be found each year during the course of extensive ground-based waterfowl research and surveys. Given the paucity of early-recorded observations, only subjective estimates can be made of the Steller's eider's historical abundance or distribution on the Y-K Delta.

A few Steller's eiders were reportedly found nesting in other locations in western Alaska, including the Aleutian Islands in the 1870s and 80s (Gabrielson and Lincoln 1959), Alaska Peninsula in the 1880s or 90s (Murie and Scheffer 1959), Seward Peninsula in the 1870s (Portenko 1972), and on Saint Lawrence Island as recently as the 1950s (Fay and Cade 1959). It is unknown how regularly these areas were used or whether the species ever nested in intervening areas.

Post-Breeding Distribution and Fall Migration: Following breeding, males and some females with failed nests depart their Russian nesting area and return to marine waters (Solovieva 1997). We know little of Steller's eiders use of marine waters adjacent to Alaska's Arctic Coastal Plain and along the west and southwest coast of Alaska during late summer and fall migration. Historical observations made by Murdoch (1885 as in Bent 1987) indicate that birds that have bred near Point Barrow begin to return to the coast from the first to the middle of July. In addition, he indicated that they disappear from the Barrow area from the first to the middle of August. Steller's eiders arrived at St. Michael around 21 September (Bent 1987). Late date of departure was as follows: Point Barrow, September 17; St. Michael, October 5; and Ugashik, November 28 (Bent 1987).

Over 15,000 Steller's eiders were observed on September 27, 1996, in Kuskokwim Bay (Larned and Tiplady 1996). Most (nearly 14,000) were located along the mainland side of barrier islands while about 1,100 were detected further offshore. Despite this species' apparent preference for near shore habitats, several groups were detected over 10 kilometers (km) from shore and two groups were over 30 km from shore.

In late summer and fall, large numbers of Steller's eiders molt in a few lagoons located on the north side of the Alaska Peninsula (i.e., Izembek and Nelson Lagoon/Port Moller Complex, Seal Islands) (Petersen 1980 & 1981). Recent observations of over 15,000 Steller's eiders in Kuskokwim Bay, and the observation of two out of three satellite-tagged birds from Barrow molting there suggests that Kuskokwim Bay may also be a notable molting area for this species and for the listed entity (Larned and Tiplady 1996; Philip Martin, Service, pers. comm. 2000). Following the molt, large numbers of Steller's eiders are known to over winter in near shore marine waters of the Alaska Peninsula, Aleutian Islands, Kodiak Archipelago, and the Kenai Peninsula (e.g., within Kachemak Bay).

Molt Distribution: After breeding, Steller's eiders move to marine waters where they undergo a flightless molt for about three weeks. The majority is thought to molt in four areas along the Alaska Peninsula: Izembek Lagoon (Metzner 1993; Dau 1991; Laubhan and Metzner 1999), Nelson Lagoon, Herendeen Bay, and Port Moller (Gill et al. 1981; Petersen 1981). Additionally, smaller numbers are known or thought to molt in a number of other locations along the western Alaska coast, around islands in the Bering Sea, along the coast of Bristol Bay, and in smaller lagoons along the Alaska Peninsula (Swarth 1934; Dick and Dick 1971; Petersen and Sigman 1977; Wilk et al. 1986; Dau 1987; Petersen et al. 1991).

Winter Distribution: Following the molt many, but not all, Steller's eiders disperse from major molting areas to other portions of the Alaska Peninsula and Aleutian Islands. 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 (Larned 2000a, Bent 1987, Agler et al. 1994, Larned and Zwiefelhofer 1995).

Larned (2000b) did not see Steller's eiders along most of the surveyed Alaska Peninsula coastline during winter. Most of the birds were concentrated within relatively small portions of the coastal waters. Much of the population, detected during spring migration, was not detected on this winter survey. We believe this was because many Steller's eiders winter farther west in the Aleutian Islands and/or along the south side of the Alaska Peninsula.

Spring Migration: In the spring, Steller's eiders form large flocks along the north side of the Alaska Peninsula and move east and north (Larned et al. 1993, Larned 1998, Larned 2000b). Spring migration usually includes movement along the coast, although birds may take shortcuts across water bodies such as Bristol Bay (William Larned, Service, pers. com. 2000). Interestingly, despite many daytime aerial surveys, Steller's eiders have never been observed during migratory flights (William Larned, Service, pers. Comm.). Larned (1998) concluded that Steller's eiders show strong site fidelity to "favored" habitats during migration, where they congregate in large numbers to feed before continuing their northward migration.

The number of Steller's eiders observed in each site during migration surveys should be considered a minimum estimate of the number of eiders that actually use these sites during migration. These data represent eider use during a snapshot in time, when in reality, a stream of eiders likely flows into and out of these sites throughout the migration season. The spring migration survey was not intended to document the intensity of use of any particular site by Steller's eiders, but was designed to monitor the entire population of Steller's eiders and other sea ducks during the spring migration.

Because the spring Steller's eider aerial survey was not intended to quantify use of any particular area by Steller's eiders during spring migration, care must be taken in interpreting the results with this purpose in mind. For example, Steller's eider use of habitat near Ugashik and Egegik Bays was documented in 1992, 1993, 1997, and 1998 (Larned et al. 1993, Larned 1998). However, in 2000, no Steller's eiders were observed there (Larned 2000b). In fact, no Steller's eiders were observed from the Cinder River Sanctuary to Cape Constantine; an expanse of approximately 110 miles of coastline which encompasses these bays and which has had several thousand Steller's eiders documented in previous years (Larned et al. 1993, Larned 1998). However, 15,000 Steller's eiders were observed south of this area and were distributed between Port Heiden and Port Moller (Larned 2000b). Three days later, about 43,000 Steller's eiders were observed south of Port Moller (Larned 2000b). The birds were, in essence, stacking up behind Port Moller, or were otherwise phenologically late in their migration relative to the previous few years. Regardless, survey results from that year suggested low use of habitats north of Port Moller, even though the birds that were counted south of Port Moller presumably used those more northerly habitats following the conclusion of the spring aerial survey.

Several areas receive consistent use by Steller's eiders during spring migration, including 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 (Larned et al. 1993, Larned 1998, and Larned 2000b).

<u>Summer Distribution in Southern Alaska</u>: A small number of Steller's eiders are known to remain along the Alaska Peninsula and Kachemak Bay during the summer;

approximately 100 have been observed in Kachemak Bay, while a few may spend the summer at Izembek Lagoon (Chris Dau, Service, pers. comm.).

Site Fidelity

Steller's eiders appear to show site fidelity at different spatial scales during different times of the year. There is good evidence of fidelity to molting sites in this species. About 95 percent of recaptured molting Steller's eiders are recaptured at the same site at which they were banded (Flint et al. 2000). Flocks of Steller's eiders make repeated use of certain areas between years (Larned 1998), although it is unknown to what extent individuals display repeated use of these areas.

Female philopatry to breeding grounds in waterfowl species is high. Female waterfowl tend to return to the area where they hatched for their first nesting effort, and subsequently tend to return to the same area to breed in the following years (Anderson et al. 1992). Despite having had only a few opportunities to observe Steller's eiders breeding on the Y-K Delta, we have observed philopatry displayed by a female Steller's eider there; one individual chose nest sites in two consecutive years that were about 124m apart (Paul Flint, U. S. Geological Service, Biological Resource Division, pers. comm. 1999). Banding data from the Barrow area suggests some level of site fidelity for Steller's eiders breeding there as well (Quakenbush et al. 1995; Phillip Martin, Service, pers. comm. 2000). Interestingly, natal philopatry has not been observed in Steller's eiders nesting in Russia (D. Solovieva, Zoological Institute, Russian Academy of Science, pers. comm.).

Further evidence of breeding site fidelity is found in other sea ducks. Female spectacled eiders did not move between general nesting areas (coastal versus interior) between years (Scribner et al. 2000). In addition, mitochondrial DNA analysis indicates that female spectacled eiders tend to return to their natal breeding area once they are recruited to the breeding population (Scribner et al. 2000). Natal, breeding, and winter philopatry in other sea ducks has also been documented (Dow and Fredga 1983, Savard and Eadie 1989, Robertsen 1997, Robertson et al. 1999).

Preliminary data from radio transmitters placed on 23 Steller's eiders captured in Captain's Bay and around Amaknak Island (near Dutch Harbor) in spring 2001 also reveal that eiders show site fidelity to general wintering areas (USGS 2001). Steller's eiders remained in the general vicinity from which they were initially captured from mid-February to mid-March 2001 when the radio transmitters stopped working (Paul Flint, USGS, pers. comm.). The birds marked in Captains Bay were never detected outside of the area that the flock was observed using. Birds marked around Amaknak Island remained in the general area, but appeared to use a larger home range. Satellite telemetry data indicated that two tagged Steller's eiders used an area of only a few square kilometers from November through Feburary (Philip Martin, Service, pers.comm.). Although further investigation is needed, preliminary studies suggest that Steller's eiders show high site fidelity at over wintering sites, at least within one winter season. Whether Steller's eiders show fidelity to over wintering sites between years remains unknown.

We note that site fidelity has been observed in wintering harlequin ducks; they showed strong site fidelity for short stretches (5 km) of coastline (Cooke et al. 2000). Robertson et al. (1999) concluded that strong site tenacity suggests that local knowledge of an area is valuable and may help ensure high survival of individuals remaining in a familiar site. They suggest that site fidelity would be expected of long-lived species that are sensitive to adult mortality and depend, at least in part, upon habitat stability for survival.

Population Structure

Genetic analysis of vertebrate populations suggests that there are often genetic gradients or differences that correspond to the geographic distribution of the species (Lande and Barrowclough 1987). The Alaska breeding population of Steller's eiders may contain unique geographic sub-populations because of: (1) the distance between breeding populations on the Yukon-Kuskokwim (Y-K) Delta and the Arctic Coastal Plain [about 804 meters (500 miles)], and (2) the anticipated site fidelity of nesting adult females (Anderson et al.1992). The similarly distributed North Slope and Y-K Delta populations of spectacled eiders possess distinct mitochondrial DNA markers, implying limited maternal gene flow between these two areas for that species (Scribner et al. 2000).

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. During the fall and winter, Steller's eiders forage on a variety of invertebrates that are found in near-shore marine waters (Metzner 1993, Petersen 1981, Bustnes et al. 2000). Esophageal contents from 152 Steller's eiders collected at Izembek Lagoon, Kinzarof Lagoon, and Cold Bay, Alaska, indicate Steller's eiders forage on a wide variety of invertebrates (Metzner 1993). According to Metzner (1993), marine invertebrates accounted for the majority of the Steller's eider diet (92%, aggregate dry weight). In addition, occurrence of shell-free prey (e.g., Crustacea, Polychaeta) predominated, compared to that of food items with shells (Metzner 1993). Metzner (1993) concluded that Steller's eiders were opportunistic generalists, foraging primarily on fauna associated with eelgrass beds in Izembek Lagoon and Kinzarof Lagoon, and infauna, epibenthos, and highly mobile fauna. During molt, Steller's eiders were found to have consumed blue mussel (*Mytilus edulis*), other bivalves (e.g. *Macoma balthca*), and amphipods (a small crustacean). They were also found to have consumed more blue mussels while growing wing-feathers (Petersen 1981).

In northern Norway, 31 species were identified as Steller's eider winter food items; 13 species of gastropods (68.4% of total number of items), four species of bivalves (18.5%); 12 species of crustaceans (13%); and two species of echinoderms (0.1%) (Bustnes et al. 2000). Juveniles sampled in this study fed more on crustaceans (x = 61% aggregate wet weight) than did adults (x = 26% aggregate wet weight). Examination of female Steller's eiders found dead near Barrow had consumed mostly Chironomid larvae, which are the predominant macrobenthic invertebrate in arctic tundra ponds (Quakenbush et al. 1995).

Predators

Predators of Steller's eiders include snowy owls (*Nyctea scandiaca*), short-eared owls (*Asio flammeus*), peregrine falcons (*Falco peregrinus*), gyrfalcon (*Falco rusticolus*), pomarine jaegers (*Stercorarius pomarinus*), rough-legged hawks (*Buteo lagopus*), common raven (*Corvus corax*), glaucous gulls (*Larus hyperboreus*), arctic fox (*Alopex lagopus*), and red fox (*Vulpes vulpes*). Quackenbush et al. (1995) reported five adult male and three adult female Steller's eiders taken by avian predators in four years near Barrow. Predators included peregrine falcons, gyrfalcons, and snowy owls. In addition, pomarine jaegers preyed on Steller's eider eggs. On the Y-K Delta, Steller's eider nests have been destroyed by gulls (Paul Flint, USGS, pers. comm., 1999).

Population Dynamics

Population Size

<u>Yukon-Kuskokwim Delta</u>: Estimating the size of the Steller's eider breeding population in Alaska has proved difficult. The large sampling errors associated with systematic aerial surveys preclude generation of an accurate/precise statistical estimate. Aerial surveys that included the Y-K Delta but did not include the Arctic Coastal Plain indicate that the population sizes of eiders (*Polysticta stelleri* and *Somateria* spp.) had declined by 90% since 1957 (Hodges et al. 1996). For the 1950s and early 1960s, the upper limit of the population, excluding the North Slope, had been estimated to be approximately 3,500 pairs (Kertell 1991). Kertell noted, however, that the population might have been smaller due to the potential restriction of nesting Steller's eiders to specific habitats. Kertell (1991) concluded that the Steller's eider had been extirpated from the Y-K Delta prior to 1990.

Since publication of Kertell (1991), a few pairs of Steller's eiders have nested on the Y-K Delta (Table 1) (Paul Flint, USGS, pers. comm. 1999). In no single year have biologists found more than three nests there, despite extensive ground-based nest search efforts in good spectacled eider breeding habitat.

Table 1. Recent sightings of Steller's eiders on the Y-K Delta (Paul Flint pers. comm. 1999)

Year	General Location	Number of Pair	Nest Detected	Number of Eggs	Fate of Nest
1994	Kashunuk River near Hock Slough	1	1	7	Destroyed by Gulls
1996	Tutakoke River	1	1	6	Unknown
1997	Tutakoke River	2	0	NA	NA
1997	Kashunuk River	1	1	6	Hatched
1998	Tutakoke River; Kashunuk River	2;1	2; 1	Unk.; 7	Destroyed; Hatched

NA-Not Applicable
Unk.-Unknown

Arctic Coastal Plain: Aerial breeding pair surveys have been conducted on the Arctic Coastal Plain of Alaska for a number of years at two different times during the Steller's eider nesting process. Mallek and King (1999) and Brackney and King (1995) (Table 2) report on surveys that are designed for optimal population estimates for the greatest number of breeding waterfowl species on the Arctic Coastal Plain. Larned and Balogh (1996) (Table 3) report on annual aerial surveys conducted since 1992 that are designed to provide optimal population estimates for spectacled eiders. Quakenbush et al. (1995) report on ground surveys conducted specifically for Steller's eiders around Barrow from 1991-1994. Laing (1995) has conducted helicopter based brood surveys around Barrow and south of Barrow. ABR (1999) conducted intensive aerial surveys within the "Barrow Triangle" area; surveys that, when compared to concurrent ground surveys, may be used to help derive an aerial survey visibility correction factor. Martin and Obritschkewitsch (Service, unpub. info.) conducted such concurrent ground surveys during three different years (1999, 2000, and 2001), however, survey results are inconclusive due to substantial variation among visibility correction factors across years. Despite attacking the problem of Steller's eider population estimation from many different angles, our collective efforts have shed little light on which method results in the best estimate and what the best population point estimate actually is. The problem of population estimation lies largely with the fact that the species is spread across a huge landscape at very low densities. In addition, we acknowledge that the number of Steller's eiders present on the Arctic Coastal Plain may fluctuate dramatically from year to year for reasons that are unclear to us. However, it is the opinion of the biologists most familiar with the species on its Arctic Coastal Plain nesting grounds that the breeding population there is best described as numbering in the hundreds, or perhaps in the very low thousands.

Table 2. Aerial population estimates from aerial breeding pair surveys on the Arctic Coastal Plain (Mallek and King 1999).

Year	Population Estimate
1989	2,002
1990	534
1991	1,118
1992	954
1993	1,313
1994	2,524
1995	931
1996	2,543
1997	1,295
1998	281
1999	1,250

Table 3. Aerial population estimates for Arctic Coastal Plain (1992-2000).

Year	Number Seen	Population Estimate	95% Confidence Interval	Researcher(s)
1992	0	0	NA	Larned and Balogh (1996)
1993	11	263	11-713	Larned and Balogh (1996)
1994	4	91	4-215	Larned and Balogh (1996)
1995	14	322	14-725	Larned and Balogh (1996)
1996	0	0	NA	Larned and Balogh (1996)
1997	8	189	8-432	Larned et al. (1999)
1998	0	NA	NA	Larned et al. (1999)
1999	31	NI	NI	Larned pers. comm. 2000
2000	0	NA	NA	Larned pers. comm. 2000

ACP-Arctic coastal plain
NA-Not Applicable
NI-Not Indicated

Population Variability

Variability in the abundance of the Alaska breeding population of Steller's eiders is not well understood. The sampling errors around our population estimates are large enough to obscure large annual population fluctuations. However, ground-based efforts in the Barrow area suggest that the local breeding populations there fluctuate dramatically (Quakenbush et al. 1995). Indeed, during some years, Steller's eiders completely forego nesting in this area.

Population Stability

The Steller's eider is a relatively long-lived species. Such species do not typically display highly variable populations. That Steller's eiders completely forego nesting in some years near Barrow is consistent with the reproductive strategy for a long-lived species (Begon and Mortimer 1986). However, mortality factors may be undermining this species' ability to maintain a stable population.

The population of Steller's eiders molting and wintering along the Alaska Peninsula appears to be declining (Flint et al. 2000, Larned 2000b). In addition, comparison of banding data from 1975 -1981 to 1991-1997 indicates a reduction in Steller's eider survival over time (Flint et al, 2000). Population models for other waterfowl applied to this species indicate that the observed reduction in annual survival over time would have a substantial negative effect on populations (Schmutz et al. 1997, Flint et al. 2000). If this decline is caused by something in the marine environment, it is reasonable to conclude that the Alaska breeding population and Asia breeding population are being affected similarly.

Status and Distribution

Reasons for Listing

The Alaska breeding population of Steller's eiders was listed as a threatened species on June 11, 1997 (Service 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 (Service 1997).

<u>Habitat Loss</u>: 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 (Service 1997). Within the marine distribution of Steller's eiders, perceived threats include marine transport, commercial fishing, and environmental pollutants (Service 1997).

<u>Hunting</u>: 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 (Service 1997). However, the gathering of subsistence harvest information similar to that collected from Native residents of the Y-K Delta has met with resistance from Native organizations on the Arctic Coastal Plain.

<u>Predation</u>: 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 Y-K Delta (Service 1997). 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 (Service 1997).

Lead Poisoning: The presence of lead shot in the nesting environment on the Y-K 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 (Service 1997).

Ecosystem Change: Direct and indirect changes in the marine ecosystem caused by increasing populations of Pacific walrus (*Odobenus rosmarus*), gray whale (*Eschrichtius robustus*), and sea otter (*Enhydras lutris*), were cited as potential causes of the decline of Steller's eiders. 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 (Service 1997). However, we are unaware of any link between changes in the marine environment and contraction of the eider's breeding range in Alaska (Service 1997).

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 2000b). Indeed, long term survey data suggests a 7.6% annual decline in migrating Steller's eiders ($R^2 = 0.86$; Larned 2002). The imprecision of our breeding ground estimates precludes us from detecting 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. The gregarious behavior of Steller's eiders during a spill event may result in acute and/or chronic toxicity in large numbers of birds. Indeed, Larned (2000b), expressed concern for the survival and reproductive success of the large number of Steller's eiders observed in harbors.

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. Harlequin ducks and long-tailed ducks exist near their energetic limit in such climates (Goudie and Ankney 1986), and the Steller’s eider is intermediate in size to these two species. Therefore, 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 (Holmes et al. 1978, Holmes et al. 1979, McEwan and Whitehead 1980, Leighton et al. 1983, Holmes 1984, Leighton 1993, Rocke et al. 1984, Yamato et al. 1996, Glegg et al. 1999, Trust et al. 2000, Esler et al. 2000) and their prey (e.g., amphipods and snails; Newey and Seed 1995 as in Glegg et al. 1999, Finley et al. 1999). Therefore, we believe that spilled petroleum is likely to adversely affect Steller’s eiders.

Increased Risk of Lead Poisoning: Because this species continues feeding near the nesting site before and during incubation (D. Solovieva, pers. comm. 2000), it may be subjected to an increased risk of exposure to lead shot over other waterfowl species that largely forego feeding at this time. Spectacled eiders do not seem to engage in feeding activities as much as Steller’s eiders once breeding has commenced, however, spectacled eiders have been observed to have higher rates of exposure to lead than any species sampled on the Y-K Delta (Flint et al. 1997). The proportion of spectacled eiders on the Y-K Delta’s lower Kashunuk River drainage that contained lead shot in their gizzards was high (11.6%, N = 112) compared to other waterfowl in the lower 48 states from 1938-1954 (8.7%, N = 5,088) and from 1977-1979 (8.0%, N = 12,880). Blood analyses of spectacled eiders indicated elevated levels of lead in 13% of pre-nesting females, 25.3% of females during hatch, and 35.8% of females 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). Thus, if spectacled eiders have experienced population level effects on the Y-K Delta due to lead poisoning, then Steller’s eiders may have experienced similar, or even greater lead-induced effects.

Collisions with Manmade Structures: Steller’s eiders have been documented 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 in the wintering area along the Alaska Peninsula. “Bird storms” are a well-documented occurrence within the commercial crab fishery fleet, a result of their use of bright lights during inclement nighttime weather. In December 1980 or 1981, “at least 150” dead eiders (species unknown) were reported to be on the deck of the M/V *Northern Endeavor* the morning after the vessel, with crab lights illuminated, anchored on the Bering Sea side of False Pass (Day 2001). Based on the time of year and location, we assume these to be Steller's eiders. Two Steller's eiders died after striking the crab lights of the P/V *Wolstad* on February 15, 1994; no additional information was provided with this report. One male Steller's eider landed on the deck of the *Elizabeth F* on February 14, 1997, at 11:36 pm; another male Steller's eider struck the vessel and died the following day at 5:00 pm. Three spectacled eiders died after striking a Coast Guard cutter conducting sampling in the Bering Sea in March 2001. Between September 26, 2001, and October 29, 2001, the Northstar facility on the North Slope of Alaska experienced 18 sea duck mortalities and one sea duck injury due to collisions with facility infrastructure. Sixteen dead eiders of unknown species were found on October 28, 2001, on the Endicott spur drilling island. A complete search of fishery observer logbooks for additional data has not yet been completed. The actual number of birds injured and killed through collisions with manmade structures is likely higher; many injured and killed birds are believed to go undetected, unreported, or become scavenged before humans detect them.

Stochastic Events: The small population size of the Steller's eiders on the Y-K 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 that affect the survival and reproduction of individuals (Goodman 1987) (e.g., shifts in sex ratios, striking wires, being shot, oil/fuel spills). Environmental stochasticity is due to random, or at least unpredictable, changes in factors such as weather, food supply, and populations of predators (Shaffer 1987). As discussed by Gilpen (1987), small populations will have difficulty surviving the combined effects of demographic and environmental stochasticity. The risk of local extirpation is probably highest for Steller's eiders nesting on the Y-K 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 (e.g., unusually heavy ice cover in their feeding habitats).

Allee Effect: "Allee effect" refers to the destabilizing tendency associated with inverse density-dependence as it relates to population size and birth rate. One form of this occurs when the ability to find a mate is diminished (Begon and Mortimer 1986). For example, if the sex ratio of a population significantly shifts from a normal condition for a species, the ability of adults to produce young may diminish. For the Steller's eider, the higher mortality rate of males (Flint et al. 2000) may result in a lower number of pairs returning to nest (i.e., adult females unable to find a mate are effectively removed from the breeding population).

The annual survival rate for Steller's eiders molting and wintering in Alaska is estimated to be 0.899% 0.032 (±SE) for females and 0.765% 0.044 (±SE) for males (Flint et al., 2000). At this estimated annual survival rate, about 39 percent of the females of a cohort will reach 10 years of age, while only about 7 % of the males will survive for 10 years.

The observed difference in annual survival between sexes may be manifested in a skewed sex ratio (e.g. as observed in Steller's eiders during the winter of 1999/2000). Female Steller's eiders notably out-numbered male eiders on winter surveys of three areas during January, February, and March (LGL 2000a, LGL 2000b). In waters off Unalaska and False Pass, female Steller's eiders comprised 63 and 69 percent, respectively, of Steller's eiders observed (N = 2,053 and 114 respectively) (John Burns, pers. comm. 2000, LGL 2000b). At Akutan Harbor, the combined female to male sex ratio for all surveys was approximately 3 to 1 (n = 590) (LGL 2000b). Furthermore, band recoveries reported by Dau et al. (2000) also suggest a shift in Steller's eider sex ratios through time (Table 4). This observation is in stark contrast to that which is typical for many other Anatinae, where an excess of males is the norm (Johnsgard 1994). If this excess of females exists throughout the species range (as opposed to just at the three locations for which we have data) then the biased sex ratio may have implications regarding reproductive potential. Although our limited observations and Dau et al.'s (2000) banding data suggest that a biased sex ratio exists for this species, our information comes from only a few locations within the species wintering range. We do not know if this biased sex ratio exists range wide, or what may be causing it.

Table 4. Shifting sex ratio of Steller's eiders at sample area No. 1 in Izembek Lagoon. Data used are from Dau et al. (2000).

Years	Female	Male	Sample Size	Percent Male
1961-1966	271	566	837	68%
1968	60	85	145	59%
1974-1981	3576	2197	5773	38%
1991-1997	5971	708	6679	11%

Analysis of the species likely to be affected

The Steller's eider was listed as a threatened species on June 11, 1997 (62 FR 31748). Given the distribution of Steller's eiders and their life history, the construction of the harbor is likely to adversely affect this species. Adverse effects may occur due to the loss of foraging habitat, and the release of petroleum associated with vessels using the harbor and in route to and from the harbor.

ENVIRONMENTAL BASELINE

When preparing a biological opinion, under 50 CFR 402.14, the Service is responsible for evaluating the "effects of the action" (i.e., direct and indirect effects together with effects of activities that are interrelated or interdependent) on federally listed species. These effects become additive to the environmental baseline.

The "environmental baseline" section of Service biological opinions summarize the effects of past and present human and natural phenomena on the current status of threatened and endangered species and their habitat in an action area. The "environmental baseline" section establishes the base condition for natural resources, human usage, and species usage in an action area, which would be used as a point of comparison for evaluating the effects of an action.

Factors affecting species' environment within the action area

Commercial Seafood Industry

Past and present impacts to Steller's eiders resulting from the seafood industry infrastructure at Sand Point may be associated with: 1) the degradation of habitat due to the release of organic waste into near shore marine waters; 2) the loss of gill nets in near shore waters; 3) the accidental release of fuels into the marine environment during refueling operations; 4) the accidental release of petroleum through the release of contaminated bilge water or from grounded/sunk vessels; and 5) collisions with lighted fishing vessels.

Popof Strait has been listed as a Clean Water Act Section 303 (d) Tier 1 priority water body since 1996 (Alaska Departement of Environmental Conservation (ADEC) webpage). Persistent exceedances of "seafood residue" from the Trident Seafood plant at Humboldt harbor are believed to be responsible for the degradation of this water body (ADEC web page). Trident Seafood is also presently under a consent decree to reduce the amount of biochemical oxygen demand (BOD) discharged by 30%. Steller's eiders are the most abundant bird species counted during the COE 2000 and 2001 surveys (COE 2000a,b and 2001). It is likely that the fish waste from the seafood processor is degrading natural foraging habitat for Steller's eiders and birds reliant on that area may be subsequently harmed through a reduction in food availability.

The expansion of Humboldt harbor at Black Point will also enable a new seafood processor to become economically feasible (COE 1998). Permits for this plant have not yet been pursued (Larry Bartlett, Lizette Boyer, COE, pers. comm.), but if a new processor is built at Black Point, we would expect further contamination of Popof Strait unless stronger measures are taken to reduce BOD that results from the discharged seafood waste.

Petroleum Spills

Water circulation and flushing potential within the proposed harbor cite is poor (COE 1998). Exchange of water in the harbor may not adequately disperse any normal accumulation of pollutants to where they will have negligible effects on wildlife in the area (COE 1998).

Sand Point experienced petroleum spills during the 1990's period of record (COE 2000a). Based on the historical record, the total volume of released petroleum product expected at Sand Point in the future is 132 gallons annually (Day and Pritchard 2000). Patchy light sheen was observed frozen in the ice of the existing Sand Point harbor during the March survey but not during the February survey (COE 2000b). Two-cycle outboard engines, fuel tanks, and fuel tracked from outboard boats are unavoidable sources of light oil sheen in harbors.

The Trident Seafood's tank farm is located on top of a hill adjacent to the proposed harbor. The Trident Seafood's tank farm spilled approximately 127,000 – 166,000 gallons of diesel #2 on January 15-16, 1990. The spill impacted approximately 4.5 miles of ocean shoreline (Jeff Brownlee, ADEC, pers. comm.).

The accidental release of petroleum products into the marine environment at Sand Point is anticipated to continue. At this time, we do not know what effect petrolium spills have had on Steller's eiders at Sand Point.

Assumptions Used in Analysis of Past, Present and Future Effects

Proportion of Wintering Birds from Listed Population

We are assuming that 3.0 percent of all Steller's eiders observed on the wintering grounds in Alaska are from the listed Alaska breeding population. This estimate derives from our three most recent spring migration surveys for our total population estimate (82,560 birds; Larned 2000b), and the highest point estimate of nesting Alaskan birds (2,543 birds; Table 2). Both are conservative estimates and, thus, are negatively biased to an unknown degree.

Rate of Decline for Steller's Eider Populations Wintering in Alaska

We are assuming that Stellers eider populations are and will continue to decline annually at a rate of 7.6%, based on long term survey data of migrating Steller's eiders (R^2 = 0.86; Larned 2002).

Affect of Chronic Oiling on Steller's Eiders

We are assuming that survivorship is reduced annually by 5.7% as a result of chronic petroleum exposure resulting from small, but consistent oil spills, that are reasonably certain to occur. This assumption is based on results from a study comparing harlequin ducks inhabiting oiled verses unoiled bays, more than six years after a large oil spill (Esler et al. 2000). Due to the physiological and ecological similarities between harlequin ducks and Steller's eiders, Steller's eiders are assumed to respond to chronic oiling in a similar way. Furthermore, it is assumed that the reduced survivorship due to chronic oiling is additive to of the annual rate of decline of Steller's eiders wintering in Alaska due to unknown reasons (i.e., 7.6% as described above).

Boundaries of Action Area

In a 15-knot wind and water temperatures of 40 degrees Fahrenheit, only 35% of spilled fuel will evaporate in 4 hours, the duration of tidal movement between high and low tide. Sixty-five percent of the spilled fuel will remain through the entire cycle. Therefore, we assume that maximum potential drift of oil during one tidal cycle from contamination source defines the action area.

Life of the Project

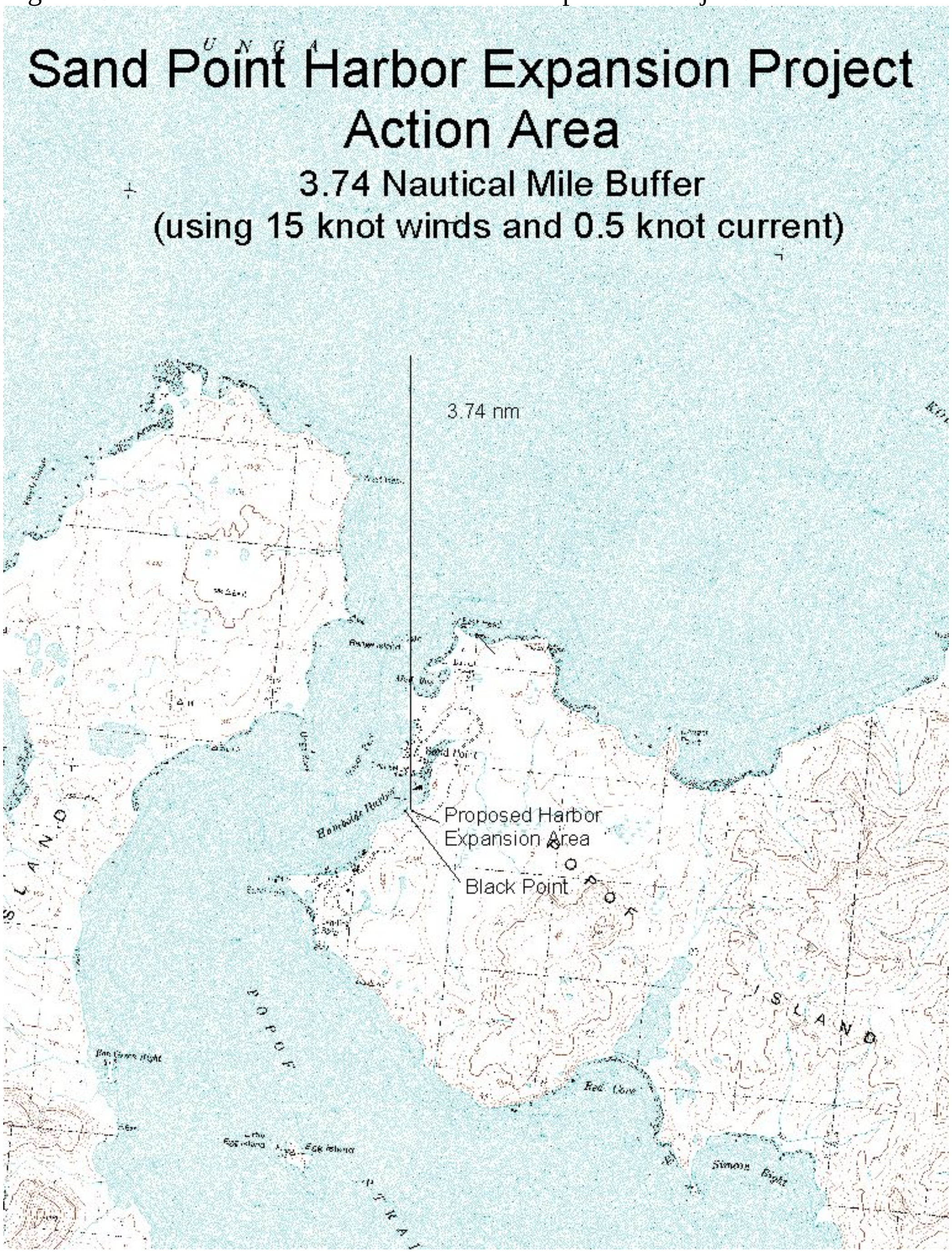
Because dock facilities are designed to last 30 – 50 years, we are assuming the life of the project is 50 years.

Determination of Action Area

Using a 0.5 knot ebb current (Lizette Boyer, COE, pers. comm.), and 15 knot winds, an oil spill may travel up to 3.74 nautical miles in one tide cycle (4 x [0.5 + (15-0.5) x 0.03]). Due to the angle of the harbor in relation to the shoreline, we are also concerned about the distance oil may travel with a flood tide at Black Point. Using a 0.2 flood current (Lizette Boyer, COE, pers. comm.) and 15 knot winds, oil may travel up to 2.58 nautical miles in one tidal cycle (4 x [0.2 + (15-0.2) x 0.03]). However, after speaking to Larry Bartlett, (COE, pers. comm.), we believed that a slight expansion of the northward buffer was necessary due to the high southwesterly winds that often occur at Sand Point.

Therefore, the action area is comprised of the harbor itself and all marine waters within a 3.74 nm radius (Figure 1).

Figure 1. Action area for Sand Point Harbor Expansion Project.



Status of the Species Within the Action Area

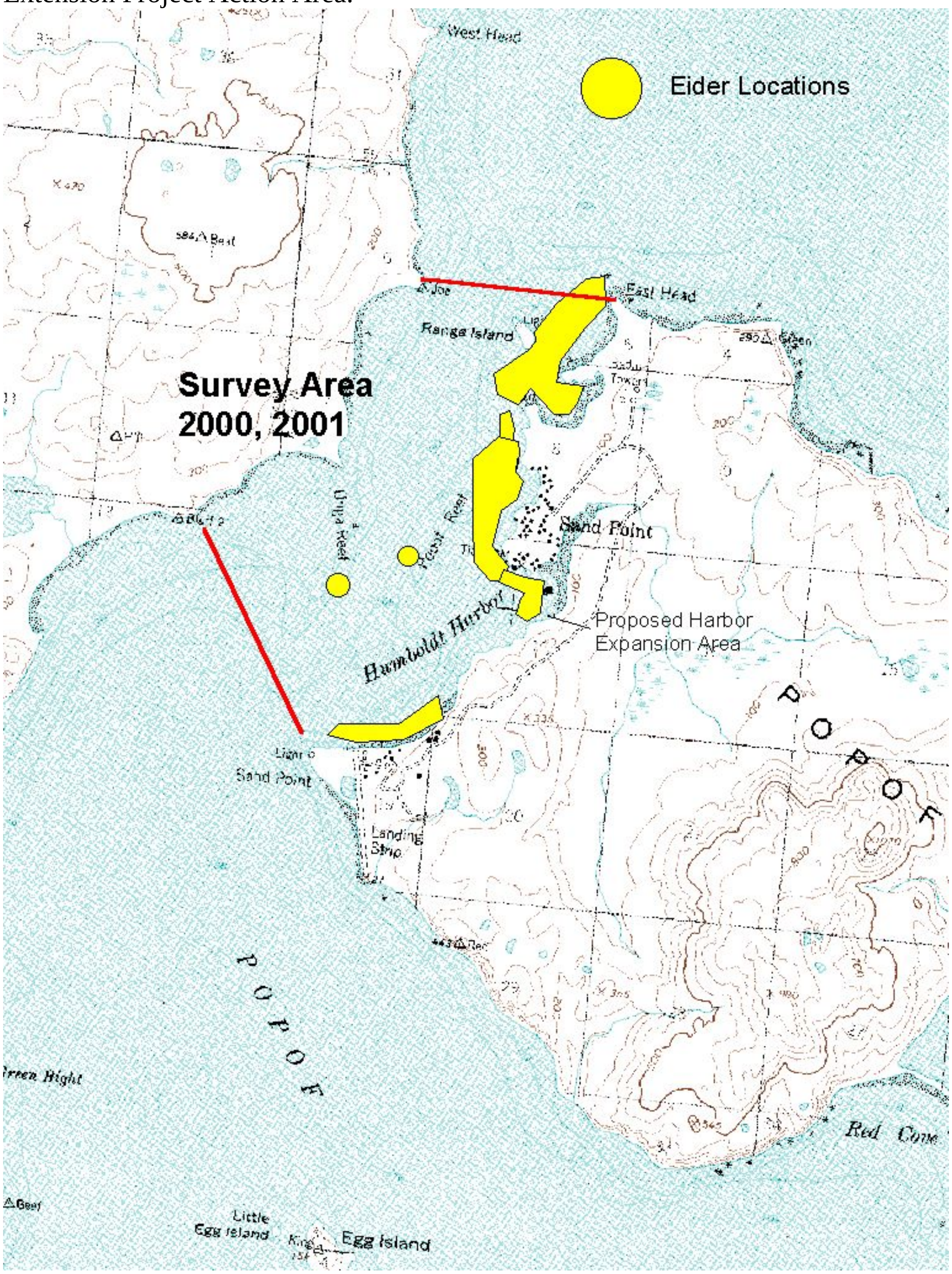
The action area of the proposed project is the footprint of the harbor plus the distance that the oil will drift with the current.

Steller's eider index surveys by land, skiff, and air were conducted during February and March 2000 and January and February 2001. The survey design, coverage and results are detailed in the survey trip reports (COE 2000b). The observed distribution of Steller's eiders within the survey area is indicated in figures from the trip reports. Eiders were concentrated to the north and west of the Black Point harbor.

Steller's eiders were surveyed for several days during both February and March of 2000. Steller's eiders were abundant in the Sand Point area during the 2000 surveys. The mean number of eiders per survey during February was 693 eiders and the mean number during March was 284 eiders. Eiders were surveyed for just one day in January and February of 2001 and the total number of eiders seen per survey was 240 and 395 eiders, respectively. Although the relative abundance of Steller's eider at Sand Point was lower in 2001, the distribution of Steller's eiders was similar between years. The 2000/2001 winter had abnormally warm temperatures that caused many bays and lagoons that typically freeze along the northern side of the Alaska Peninsula to remain open. The lower number of Steller's eiders observed at Sand Point during the 2001 surveys is probably due to atypical winter weather.

Land and skiff surveys for Steller's eiders included only those up to 400 meters (1/4 mile) from shore. Many more Steller's eiders were observed in Popof Strait beyond the 400-meter (1/4 mile) survey limit. No attempt was made to estimate the number of eiders outside the survey limit. Steller's eiders were relatively more abundant and distributed within Popof Strait north of the Sand Point harbor and the Trident Seafood plant than they were south of these developments. Concentrations of Steller's eider were observed in survey sectors 1, 2, and the northern portion of sector 3. Comparatively few Steller's eider were observed using habitat in sector 3 south of the Trident Seafood plant or in sector 4. No Steller's eiders were observed in sector 5 adjacent to the airport runway. The majority of eiders in the immediate vicinity were distributed along the western shore of Popof Island from the harbor north to East Head during both types of surveys (COE 2000b, 2001; Figure 2).

Figure 2. Maximum extent of Steller's eider distributions within the Sand Point Harbor Extension Project Action Area.



Eel grass beds, areas where Steller's eiders are known to feed, exist at the Black Point site, being most prevalent near the existing south breakwater. Varying numbers of Steller's eider (0 to 30) were observed within the harbor expansion site at Black Point during the daily surveys (COE 2000a, b). No Steller's eiders were observed to use the harbor footprint during the 2001 surveys. Three Steller's eider were observed foraging in the construction zone during the January 2001 survey (COE 2001).

The distribution of Steller's eider noted during February and March 2000 aerial surveys reported abundance similar to the land and skiff surveys (922 birds in February and 346 birds in March; Larned 2000a).

EFFECTS OF THE ACTION

"Effects of the action" refers to the direct and indirect effects of the action on the species or its critical habitat. The effects of the action will be evaluated together with the effects of other activities that are interrelated or interdependent with the action. These effects will then be added to the environmental baseline in determining the proposed action's effects to the species or its critical habitat (50 CFR Part 402.02). Indirect effects are those that are caused by the proposed action and are later in time, but still are reasonably certain to occur.

Factors to be considered

Proximity to the action:

At least 30 Steller's eiders have been observed within the harbor expansion site (COE 2000 a,b) and 922 Steller's eiders have been observed within the action area of the proposed project (Larned 2000a). Although the action area contains eider foraging and resting habitat, this habitat has not been designated as Critical Habitat.

Distribution:

The location of the proposed harbor project occurs within the nonbreeding habitat of Steller's eiders.

Timing:

The construction of the proposed harbor is anticipated to occur during the summer while Steller's eiders are not present. However, the proposed harbor will be operating while Steller's eiders are present in the area.

Nature of the effect:

Direct and indirect effects anticipated due to construction and operation of the harbor include: 1) the loss and degradation of Steller's eider foraging and resting areas, 2) increased petroleum pollution as a result of chronic oiling, and 3) increased probability of bird strikes. Construction of the harbor will result in the direct loss of habitat where 5 to 30 Steller's eiders were observed resting almost every day during the February and March 2000 surveys (COE 2000b). Although eiders were not seen foraging within the harbor expansion site, it is reasonable to assume that eiders forage in areas in which they occur. This assumption is supported by the observation of eiders foraging nearby in the construction zone adjacent to the footprint of the harbor (COE 2001).

The effects of displacing wintering Steller's eiders in Alaska have not been investigated. However, over-winter starvation resulting from displacement from feeding areas is thought to be a contributing factor to mass mortality of common eiders in the Wadden Sea (Camphuysen 2000). Thus, eiders displaced by the habitat destruction caused by harbor construction may not be able to simply relocate without being harmed.

In addition, the accidental release of petroleum products from vessels associated with the harbor is anticipated. Accidental petroleum releases can adversely affect the Steller's eider through either contamination of feathers, direct consumption of petroleum (e.g., during preening), contamination of food resources, or reduction in prey availability. Oil spills typically increase with an increase in boat traffic and fueling operations and the risk to Steller's eider from fuel spills is expected to increase slightly with expansion of the harbor (Day and Pritchard 2000). However, providing a safe moorage for larger vessels and reducing the amount of rafting alongside or anchoring out can also reduce the risk of accidents that can result in oil spills. Furthermore, even though vessel fueling is not currently planned in conjunction with the proposed harbor facility, a bulk fuel upgrade is being considered for the near future. Included in the possible bulk fuel upgrade plan is a marine header located at the new harbor facility (Paul Day pers. comm.).

Duration:

The loss of foraging habitat due to construction of the harbor is anticipated to be permanent. The potential for accidental releases of petroleum to adversely affect Steller's eiders is anticipated to exist for as long as the harbor is in operation.

The accidental release of petroleum into the habitat of this species may have both an immediate and lingering adverse effect. Oiling of birds, may result in sickness or death, depending on the degree of exposure. Petroleum products released into the marine environment can also have adverse effects that last from several months to several years.

Anticipated adverse effects range from changes in prey abundance, distribution, and diversity, to the ingestion of chronic toxic levels of petroleum.

Disturbance frequency:

We have little information that would allow us to predict disturbance frequency. Although construction of the harbor essentially represents a one-time disturbance event, we lack information regarding vessel activity, petroleum spill timing and frequency, and the degree to which these vessels and the project itself will disturb Steller's eiders.

Disturbance intensity:

We have little information that would allow us to predict the disturbance intensity of the proposed action. Although we know foraging habitat will be destroyed through construction of the harbor, and we believe Steller's eiders that use the site will be harmed, we do not know how many transient and migrating Steller's eiders will be harmed, the extent of harm caused to any eider, or the effects of such harm on the population.

Disturbance severity:

Steller's eiders show high fidelity for specific molting sites within lagoons (Flint et al. 2000). Preliminary evidence suggests that Steller's eiders show high wintering site fidelity, at least within one season (Philip Martin, FWS, pers. comm., Paul Flint, USGS, pers. comm.). High levels of wintering site fidelity have been found for other species of sea ducks (Robertson et al. 1999, 2000, Cooke et al. 2000). Laubhan and Metzner (1999) demonstrated that molting concentrations of Steller's eiders found in lagoons along the north side of the Alaska Peninsula disperse during the winter. Further, they suggest that ice conditions may displace Steller's eiders from preferred locations (Laubhan and Metzner 1999). The combination of this displacement and the fact that foraging was the dominant behavior of eiders during winter (Laubhan and Metzner 1999), suggests that suitable wintering habitat may be limited for Steller's eiders. Indeed, over-winter starvation resulting from displacement from feeding areas is thought to be a contributing factor to mass mortality of common eiders in the Wadden Sea (Camphuysen 2000). This suggests that alternative foraging areas of sufficient quality may not be available for some wintering eiders. Thus, eiders displaced by habitat destruction resulting from harbor construction may not be able to simply relocate without being harmed.

Analyses for effects of the action

The following summary of the description of the "action" under consultation is provided so that the subsequent analysis of effects and the scope of the biological opinion are clear. The proposed action is the summary of action.

Beneficial effects:

Beneficial effects are those effects of an action that are wholly positive, without any adverse effects, on a listed species or designated critical habitat. Although the construction and operation of the harbor will have no wholly beneficial effect on the Steller's eider, several measures included with the project description will likely minimize the harbor's effect on this threatened species. Such measures include:

1) Construction of the breakwater prior to dredging the basin to help contain any sediment plume;
2) Use of silt curtains for in-water work between April 15 and June 15;
3) Maintenance of a net disposal receptacle at the harbor to reduce at-sea net disposal; and
4) Development and implementation of an outreach/educational program to encourage proper disposal of engine oil.

Direct effects:

The construction of the harbor will result in a permanent loss of 18.3 acres of near-shore habitat that is known to be used by wintering Steller's eiders, and which may also be used by transient and migrating Steller's eiders. The effects of displacement on wintering Steller's eiders in Alaska has not been investigated. However, over-winter starvation resulting from displacement from feeding areas is thought to be a contributing factor to mass mortality of common eiders in the Wadden Sea (Camphuysen 2000). Thus, eiders displaced by habitat destruction resulting from harbor construction may not be able to simply relocate without being harmed. Because the action will result in the direct loss of foraging habitat known to support up to 30 Steller's eiders, it is estimated that one Steller's eider belonging to the listed Alaska breeding population will be taken.

Interrelated and interdependent actions:

Actions that are interrelated and interdependent with the proposed construction and operation of an expanded harbor facility in Sand Point include the increase in the number of vessels present in the action area on an annual basis. With this increase in harbor traffic comes an elevated risk of fuel spills resulting from operator error and equipment failure, as well as an increased risk of contamination resulting from release of petroleum-contaminated bilge water.

Indirect Effects:

Collisions with Lighted Vessels and Harbor-Related Structures: Anecdotal evidence that eiders and other sea ducks may become disoriented and strike vessels and other lighted structures in adverse weather conditions supports the assumption that Steller's eiders wintering in close proximity to the proposed harbor and related facilities are at increased risk of similar collisions. It is estimated that one Steller's eider belonging to the listed Alaska breeding population will be injured or killed in this manner.

Acute and Chronic Exposure to Petroleum Compounds: Exposure to petrogenic hydrocarbons from boating or fishing activities and accidental oil spills have affected or killed Steller's eiders in other harbors (Fox et al. 1997), and is cause for concern at the wintering areas of Steller's eiders in Alaska. Steller's eiders using waters within or directly adjacent to the proposed harbor will be susceptible to adverse effects resulting from petroleum spilled and released in contaminated bilge water. They may also ingest mollusks and marine crustaceans that have been contaminated with petroleum as a result of the presence of the harbor (Rand and Petrocelli 1985). In addition, eiders may suffer from reduced foraging opportunities if petroleum contamination reduces prey availability.

Petroleum may adversely affect Steller's eiders through: (1) fouling feathers, thus compromising thermoregulation; (2) causing direct toxicity through consumption of petroleum (e.g. during preening); (3) contaminating food resources; and (4) reducing prey availability due to the toxic effects of petroleum on prey species. Furthermore, the gregarious behavior of Steller's eiders may result in acute or chronic poisoning of large numbers of birds from just one spill. Additional contaminants which may be expected to be released into the marine environment as a result of boating activities include: copper from anti-fouling paints, sacrificial anodes on vessels and other protectively coated marine hardware, lead from boat batteries, engine exhaust products, cleaning agents, and grey water from holding tanks. Acute exposure due to direct contact with surface oil may result in sickness, death, or impaired physiological function. Chronic exposure to petroleum compounds through contaminated food sources may have sub-lethal effects on reproductive success, immune system function, and overall condition.

Petrolium products released into the marine environment are known to cause adverse effects on eiders (Stout 1998), other marine birds (Yamato *et al* 1996; Trust *et al* 2000; Esler *et al* 2000; Custer *et al* 2000) and their prey (Glegg *et al* 1999). Moreover, those effects can remain for years (Hayes and Michel 1999). Esler et al. (2000) found that during winter, harlequin duck survival was 5.7% lower in oiled areas compared to unoiled areas.

At least 922 Steller's eiders were observed within the action area of the harbor expansion site (Larned 2000). To calculate the risk to Steller's eiders from exposure to petroleum compounds, we used the following assumptions: 1) 3.0 percent of the Steller's eiders in the wintering population also belong to the Alaska breeding population, 2) the overall population decline is occurring at a rate of 7.6% annually, and 3) the life of the project is 50 years. The risk factor used to calculate reduced survivorship due to chronic petroleum releases, as a result of the proposed harbor expansion project, is 5.7% annually (based on Esler et al. 2000). Based on the calculations using these assumptions, approximately 11 Steller's eiders of the listed entity will be at risk of harm or death due to exposure to petroleum products or other boating related contaminants, as a result of this project (Appendix I).

Species' response to a proposed action

Numbers of individuals/populations in the action area affected:

Limited surveys have indicated that at least 30 Steller's eiders use waters within the footprint of this proposed project, and at least 922 Steller's eiders use waters that are within the action area that may be affected by vessel traffic associated with this proposed project. We believe that our estimates of numbers of birds using these waters are conservative because they do not include any of the birds that use these waters during spring and fall migration. In addition, our limited surveys represent just a few snapshots in time. It is possible that these observations do not represent the maximum number of eiders that use these waters.

Sensitivity to change:

Steller's eiders behavior changes with changing environmental conditions. At times, they have been observed foraging in close proximity to human made structures. They have also been observed foraging and resting adjacent to docks. However, we have observed that they move and maintain a distance of at least 100 meters from humans themselves. As such, we do not anticipate total abandonment of areas due to the physical presence of structures associated with the proposed project, but anticipate some level of disturbance due to the human activity associated with the proposed project.

Resilience:

We have little information suggesting what sort of resilience to perturbations is inherent in this species. We do note, however, that the world population has declined by 80% since the 1940's, from 1,000,000 (Tugarinov 1941 as in Solovieva 1997) to 200,000 in 1994 (Solovieva 1997). Extensive banding efforts and aerial survey efforts over the past decade indicate that the trend for the world population continues to be negative (Flint et al. 2000, Larned 2000b). As such, the Steller's eider does not appear to be resilient enough to overcome the mortality factors causing its decline. Whether this lack of resilience is due to low fecundity, low recruitment, or excessive adult mortality is unknown.

We note that Steller's eiders exhibit an atypical sex ratio for sea ducks (See "allee affect"). Whatever may be causing this observed shortage of males may in turn be affecting this species resilience to perturbations.

Recovery rate:

The natural recovery rate of Steller's eiders is not known. Recovery rate is a relative response and is tied, in large part, to traits of the species' life history. In general, long-lived species with low annual fecundity should have a relatively slow recovery rate compared to short-lived species with high annual fecundity. Given the Steller's eider's observed low fecundity, i.e., small clutch sizes, high variability in nesting attempts, and generally low nest success (Quakenbush et al. 1995, D. Solovieva pers. com. 2000), the recovery rate for this species may be quite slow. Unnaturally high mortality of breeding adults may even prevent recovery of this species.

CUMULATIVE EFFECTS

Cumulative effects include the effects of future State, tribal, local or private actions that are reasonably certain to occur in the action area considered in this biological opinion. 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.

Fisheries conducted in near shore waters may impact this animal. The potential for conflict is especially high where large numbers of this species congregate to molt. At this time, information regarding potential conflicts is not available. However, scientists in Lithuania observed that Steller's eiders are susceptible to entanglement in gill nets (Zydelis and Skeiveris 1997). Therefore, any fishery employing gill nets in waters that are also being concurrently used by Steller's eiders may result in harm to this species. It is unknown to what extent Steller's eiders are endangered by derelict gear from such net-based near-shore fisheries, but we assume that there is some risk of birds becoming entangled in such gear. Some beaches at Sand Point are littered with the remains of abandoned fishing vessels. Entire boats, engines, batteries, zinc plates, and iron objects can be found along the beaches at Sand Point (COE 2000a). Fishing vessels operating with bright lights near shore during adverse weather conditions may cause Steller's eider mortality by inducing collisions between the vessel and flying, disoriented Steller's eiders

Conclusion

After reviewing the current status of the Alaskan breeding population of Steller's eiders, the environmental baseline for the action area, the cumulative effects, and the effects of the proposed action, it is the Service's biological opinion that the action, as proposed, is not likely to jeopardize the continued existence of the species.

Steller's eiders in the Sand Point area represent approximately 1.2% of the Alaska population of Steller's eiders. This estimation was derived by dividing the total number of birds seen within the action area and believed to be from the Alaska population (1000*0.03=30), by the highest population estimate for the Alaskan population of this species (2,543). The estimate of the listed entity that occupies the action area, combined with the probability that a large oil spill will occur at Sand Point and impact all the eiders in the action area, led us to the conclusion that this action, as proposed, is not likely to jeopardize the continued existence of this species.

INCIDENTAL TAKE STATEMENT

Section 9 of the Act and Federal regulation 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 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 the 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 this Incidental Take Statement.

The measures described below are non-discretionary, and must be undertaken by the COE so that they become binding conditions of any grant or permit issued, as appropriate, for the exemption in section 7(o)(2) to apply. The COE has a continuing duty to regulate the activity covered by this incidental take statement. If the COE (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 COE or any applicant must report the progress of the action and its impact on the species to the Service as specified in the incidental take statement [50 CFR 402.14(i)(3)].

Amount or extent of take anticipated:

We anticipate that incidental take of Steller's eiders will be difficult to document because: 1) the effects of the loss of a foraging area to Steller's eiders that use that area will be difficult to quantify; 2) Steller's eiders exposed to petroleum levels that are not immediately lethal may not die near the location of contact; 3) Steller's eiders exposed to sub-lethal levels of petroleum will not exhibit readily apparent signs of toxicity; 4) impacts to prey abundance and distribution from released petroleum products will not be readily apparent; 5) the extent to which petroleum contamination can be attributed to the proposed action will be difficult or impossible to determine, and 6) the number of Steller's eiders belonging to the Alaska breeding population at this site is unknown.

The Service will not refer the incidental take of any migratory 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.

Take Related to Harbor Construction

The Service expects that construction of the harbor will result in take due to permanent loss of 18.3 acres of near-shore habitat known to be used by wintering Steller's eiders. **The take of one Steller's eider of the listed entity is expected to be in the form of harm resulting from the permanent loss of foraging and resting winter habitat because harbor construction will substantially alter or destroy the biota in this area that is currently used by eiders**.

Take Related to Acute and Chronic Exposure to Petroleum Compounds

The Service anticipates that petroleum releases will occur in association with the legal operation of the harbor due to operator error, equipment failure, sunken vessel, or contaminated bilge water discharges. This recognition by the Service is not intended to legitimize the otherwise illegal act of releasing petroleum into the environment. **We estimate that no more than 11 Steller's eiders of the listed Alaska breeding population will be taken as a result of petroleum releases that occur within Sand Point Harbor.** This take is expected to be in the form of harm or direct lethal take.

Take Related to Collisions with Vessels or Structures

The Service expects that the operation of the harbor will result in harm or direct lethal take of birds striking harbor-related facilities, including vessels moored within the addition to Sand Point Harbor. We anticipate that this take will be in association with the use of bright lights during poor weather. **We estimate that no more than one Steller's eider of the listed Alaska breeding population will be taken as a result of striking harbor-associated structures, including moored vessels.**

In total, the Service expects that the construction and operation of the harbor expansion project in Sand Point, Alaska will result in the take of 13 Steller's eiders of the Alaska breeding populations.

We are currently unable to distinguish between North American breeding Steller's eiders and Steller's eiders that breed elsewhere when the birds are present on their molting or wintering areas. Future research may enable us to distinguish between listed and non-listed populations. Absent such capabilities, we will assume the expected take levels associated with this Incidental Take Statement to have been exceeded if any of the following occur:

1) Greater than 30 Steller's eiders are harmed or killed due to loss of foraging and resting habitat within the harbor;
2) Greater than one Steller's eider of the listed entity are harmed or killed due to loss of foraging and resting habitat within the harbor;
3) Greater than 30 Steller's eiders are harmed or killed as a result of striking harbor-associated structures, including vessels moored within the harbor;
4) Greater than one Steller's eider of the listed entity is harmed or killed as a result of striking harbor-associated structures, including vessels moored within the harbor;
5) Greater than 367 Steller's eiders harmed or killed as a result of petroleum releases that occur in association with the harbor;
6) Greater than 11 Steller's eiders of the listed entity are harmed or killed as a result of petroleum releases that occur in association with the harbor;

<u>Effect of the take</u>:

In the accompanying biological opinion, the Service determined that this level of anticipated take is not likely to result in jeopardy to the Steller's eider.

REASONABLE AND PRUDENT MEASURES

The Service believes the following reasonable and prudent measures are necessary and appropriate to minimize impacts of incidental take of Steller's eider:

1) The COE shall minimize the potential for impacts to Steller's eiders during construction of the harbor.

2) The COE shall minimize the potential for impacts to Steller's eiders during operation of the harbor.

3) The COE shall monitor the potential impacts of harbor operation to Steller's eiders.

TERMS AND CONDITIONS

In order to be exempt from the prohibitions of section 9 of the ESA, COE 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.

The following terms and conditions shall implement Reasonable and Prudent Measure No. 1.

1.1) The COE shall ensure that all construction activities that may harass Steller's eiders off of foraging areas shall occur prior to the birds arrival in the fall or after their departure in the spring. We estimate those dates to be November 15 for the fall arrival of eiders and March 30 for their departure. Construction can begin as soon as birds are gone from the project vicinity for seven consecutive days after February 28, upon concurrence of the Anchorage Fish and Wildlife Field Office. The COE shall immediately notify the Field Office of the presence of any Steller's eider that is observed from the project area during construction. Construction must cease by November 15.

1.2) The COE shall permanently install eye bolts into concrete or steel structures at appropriate locations of the entrance channel and breaches for rapid attachment of spill containment booms.

The following terms and conditions shall implement Reasonable and Prudent Measure No. 2.

2.1) In the Project Cooperation Agreement, the COE will require the local project sponsor to develop a Best Management Practice Plan (BMP) or Harbor Management Plan in cooperation with the City of Sand Point. This plan will follow BMP's recently developed for other harbors/marinas (Appendix II). The Service will have the opportunity to review the draft BMP. The following items shall be included in the BMP:

A.) The local project sponsor shall keep the shoreline between the proposed harbor and East Head free of any wildlife entanglement (fishing nets, parts of traps and pots, monofilament lines, ropes, cords, etc.) and contamination hazards (batteries, zinc plates, engines, etc.). Any entanglement or contamination hazards that are removed shall be disposed of according to ADEC standards.

B.) The local project sponsor shall consult with oil spill response experts to develop an oil spill response plan. The plan shall be developed to respond to large (over 500 gallon) spills that may occur within the harbor.

<u>The Oil Spill Response Plan shall:</u>

1.) Determine the best method for containing and recovering an oil spill within the harbor;
2.) Identify the types and numbers of equipment that are necessary to retain the oil within the harbor;
3.) Provide detailed instructions as to how the required equipment shall be deployed to keep the oil within the harbor, including appropriate locations for permanent boom anchor points and equipment staging areas;
4.) Identify who is the responsible party for implementing the oil spill response plan within the harbor;
5.) Identify who is the responsible party for maintaining spill response equipment in good working order;
6.) Identify vessels, within the harbor, that are capable of implementing the oil spill response plan;
7.) Provide necessary instructions to successfully implement the plan;

8.) Be implemented prior to the initiation of Phase II of construction of the new harbor.

C.) The local project sponsor shall consult with oil spill response experts to develop a site-specific oil spill response strategy to protect known areas of Steller's eider concentrations (outlined in 2.2 and the COE 2000 and 2001 boat surveys (COE 2000b and 2001)), in a worst case scenario situation.
D.) The local project sponsor shall obtain all necessary equipment, as per ADF&G recommendations, and required training and permits to haze Steller's eiders away from oil spilled at the harbor or associated harbor activities (see Appendix III for list of hazing equipment, and permit and training information). The necessary hazing equipment shall be obtained and training completed by September 1 of the year that operation of the harbor commences.
E.) Recruit, train, and maintain an updated list of vessels and personnel qualified to carry out hazing in the event of an oil spill outside the harbor.
F.) At least one qualified oil-spill response individual shall be present at Sand Point during harbor operations.
G.) The local project sponsor shall obtain all necessary equipment to implement this oil spill response plan by September 1 of the year that operation of the harbor commences. The local project sponsor shall ensure that the equipment needed to implement this oil spill response plan, within the harbor, is procured, readily available for deployment, and passes annual inspections by an oil spill response organization. The local project sponsor or their contractor is responsible for maintaining the equipment in good working order.
H.) A qualified individual at Sand Point, or an oil spill response organization, is responsible for coordinating and conducting annual oil spill response drills for spills that occur within the harbor.

2.2) The COE will conduct three boat or aerial surveys between November 15, 2001 - March 31, 2002, to map the distribution of Steller's eiders north from the proposed harbor to East Head, west to Joe, south to Unga Reef. Weather, daylight, and safety permitting, the surveys will be extended further south from Unga Reef to Bluff 2 and south of the proposed harbor to the Sand Point peninsula (Fig. 1). Weather permitting, the surveys will be conducted according to the following schedule: The first survey will be conducted when Steller's eiders have just arrived to Sand Point, between November 30 and December 15, 2001. The second survey will be conducted at the peak abundance of Steller's eiders, between February 1 -

15, 2002. The final survey will be conducted in late winter, between March 15 - 30, 2002, when migrating Steller's eiders may also be present. The COE shall coordinate with the U.S. Fish and Wildlife Service on the study design for this survey prior to its initiation. Information gathered during these surveys will be used to create a map of the concentration areas of Steller's eiders within the action area of this proposed project. (Note, due to previous coordination on this issue, this term has been completed).

2.3) Stationary lighting that is associated with the operation of the proposed harbor shall be shielded downward in such a way as to minimize the hazard of disorienting flying birds and causing them to strike fixed objects. The COE shall coordinate with the Service on the specifications for shielded lighting to be installed by the local sponsor.

The following terms and conditions shall implement Reasonable and Prudent Measure No. 3.

3.1) The COE shall monitor the releases of petroleum at the existing harbor. The COE shall coordinate with the Service on the study design for this monitoring effort prior to its initiation. Applicable methods are currently being developed by the Service and COE. Petroleum release monitoring shall occur pre-construction and for 4 consecutive years post-construction. A summary report shall be submitted to the Service annually. After five sampling periods, the monitoring terms will be re-evaluated by the Service and COE.

3.2) In the Project Cooperation Agreement, the COE will require that collision of Steller's eiders with physical structures, associated with the operation of the harbor, be monitored by the local project sponsors. Eiders that have been injured or killed by colliding with harbor-related structures shall be immediately reported to the Anchorage Fish and Wildlife Field Office (Appendix IV). Information and instructions will be posted around the harbor informing the public that injured eiders should be immediately reported. Dead Steller's eiders shall be salvaged and kept frozen until they can be transferred to the Service. The Service shall work with parties that find injured Steller's eiders to help them arrange the birds' transportation to rehabilitation facilities if such action is deemed warranted.

A.) The local project sponsor shall pay for the expenses incurred in shipping and rehabilitating birds injured through collision with structures associated with the presence of the proposed harbor (including, but not limited to associated power lines and poles, pilings, vessels moored in the harbor, and other structures present within and adjacent to the Harbor that are associated with the operation of the harbor).

B.) The local project sponsor shall coordinate with the Service on the design and placement of notices urging the public to report dead or injured Steller's eiders. The local project sponsor shall cover the expenses associated with the printing and maintenance of these notices, and see that these notices are maintained in a readable manner throughout the year for the duration of the operation of the harbor, or until the Service no longer deems this measure necessary.

3.3) The COE shall continue to monitor Steller's eider use of waters near the action area following the survey design used by the COE in the preconstruction phase of this proposed project. Surveys shall be conducted once a month in November, December, January, and February during the first two winters following construction of the proposed harbor. The COE may, alternatively, require the local project sponsor to fund a private consultant or the Service to conduct the surveys in the two post-construction seasons. A summary report shall be submitted by the COE to the Service annually.

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.

1.) Facilitate a cooperative agreement among the Aleutians East Borough, the City of Sand Point, and Trident Seafoods, to develop a joint oil spill response plan for worst case scenario spills occurring outside of the immediate jurisdiction of the harbor or the Trident plant.
2.) To the extent allowable, take actions that will prevent environmental contamination resulting from leaking or spilled petroleum products from the existing tanks at Trident's tank farm.
3.) To the extent allowed by the COE regulatory authorities, minimize or eliminate environmental degradation resulting from Trident's seafood processing operations.

REINITIATION NOTICE

This concludes formal consultation on the proposed action. As provided in 50 CFR §402.16, reinitiation 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 at least one of the following factors occurs: (1) the amount or extent of incidental take is exceeded; (2) new information reveals effects of the action that may affect listed species or critical habitat in a matter or to an extent not considered in this biological opinion; (3) the agency action is subsequently modified in a manner that causes an effect to the listed species or critical habitat not considered in this biological opinion; (4) a new species not covered by this opinion is listed or critical habitat designated that may be affected by this action; or (5) the action agency develops the harbor further (such as maintenance dredging). In instances where the amount or extent of incidental take is exceeded, any operations causing such take should cease pending reinitiation.

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