

In reply, refer to:
WAES

December 12, 2000

Scott R. Bearden
Environmental Resources Section
U.S. Army Engineer District, Alaska
P.O. Box 898
Anchorage, Alaska 99506-0898

Subject: Biological Opinion Regarding the Effects of Harbor Construction at False Pass, Alaska, on the Threatened Steller's Eider (*Polysticta stelleri*).

Enclosed is the U.S. Fish and Wildlife Service's biological opinion based on our review of the proposed construction of a harbor at False Pass, Alaska, and its effects on the Steller's eider (*Polysticta stelleri*) in accordance with section 7 of the Endangered Species Act (Act) of 1973, as amended (16 U.S.C. 1531 et seq.). If you have any questions regarding this consultation, future consultations, or about the consultation process in general, please contact Greg Balogh, Senior Endangered Species Biologist, at (907) 271-2778.

Sincerely,

Ann G. Rappoport
Field Supervisor

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Subject: Biological Opinion Regarding the Effects of Harbor Construction at False Pass, Alaska, on the Threatened Steller=s Eider (*Polysticta stelleri*).

This document transmits the Fish and Wildlife Service=s biological opinion based on our review of the proposed construction of a harbor at False Pass, Alaska, and its effects on the Steller=s eider (*Polysticta stelleri*) in accordance with section 7 of the Endangered Species Act (Act) of 1973, as amended (16 U.S.C. 1531 et seq.). Your September 11, 2000, request for formal consultation was received on September 14, 2000.

This biological opinion is based on information provided in the Environmental Assessment (ACOE 2000a), the Biological Assessment for the proposed project (ACOE 2000b), and a report regarding the abundance and distribution of Steller=s eiders at False Pass, Alaska (LGL 2000a). In addition, other sources of information were also used in formulating this biological opinion. The complete administrative record for this consultation is on file at the Ecological Services Anchorage Field Office.

Consultation History

On August 2, 2000, we received an August 1, 2000, request from the Army Corps of Engineers (ACOE) for our concurrence in their determination that construction of the project would not likely adversely affect the Steller=s eider. On August 31, 2000, we responded, and stated why we did not concur with their finding and recommended that they request initiation of formal consultation. On September 14, 2000, we received a September 11, 2000, request for formal consultation. We initiated formal consultation on the Steller=s eider on September 14, 2000. In regards to proposed critical habitat for the Steller=s eider, no conference was requested.

Because of the ecology and distribution of short-tailed albatross, and the location of the proposed harbor (i.e., short-tailed albatross do not rely on the harbor site), while taking into consideration the operation of the harbor, we do not believe construction and operation of the harbor would likely adversely effect this species.

Description of the proposed action

A small boat harbor is proposed for construction at False Pass, Alaska. The project is intended to provide protected moorage for commercial fishing vessels. The project includes a causeway bridge and a bulkhead dock at the seaward end of the south breakwater.

The project will encompass 6.7 hectares. Approximately 105,320 cubic meters (m³) of material will be dredged to create the 2.10 hectare basin and maneuvering and entrance channels. The basin will be dredged to design depths of -3.7 meters (m) to -5.8 m mean lower low water (MLLW) and the entrance channel to -6.1 m MLLW. Dredging would likely be done by a clamshell dredge and excavator. No in-water blasting of rock is expected. The north breakwater will be 388 m long and the south breakwater will be 180 m long. The south breakwater will also serve as a causeway for vehicle traffic to the bulkhead. Approximately 90,395 m³ of rock will be placed for breakwater construction and openings will be incorporated to allow fish passage. A locally funded bridge will be installed to span one of the fish passages. Dredged material will be discharged into deep water approximately 4.8 kilometers (km) from the harbor site in Bechevin Bay. Harbor construction will occur during the summer.

Measures incorporated into the project to reduce impacts to fish and wildlife include the use of silt curtains and/or construction timing windows to reduce turbidity, and the incorporation of openings in the breakwaters to allow for fish passage (ACOE 2000a). In addition, the placement of receptacles for waste oil at the new harbor, development and implementation of a plastic/nylon mesh recovery plan, the participation of the ACOE in follow up surveys for Steller=s eiders on a programmatic basis, and the installation of eye bolts at the entrance channel and breaches for rapid attachment of spill containment booms were listed under Mitigation Plan Topics (ACOE 2000a). Based on the Finding of No Significant Impact, the ACOE also anticipated additional minimization measures to be identified through the formal consultation process. That is, it was stated that AFormal consultation with the U.S. Fish and Wildlife Service will recommend reasonable and prudent measures to minimize effects to the threatened Steller=s eider.@

Status of the Species

Species description

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 reliance of caloric reserves. Under this life history strategy, the 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, be existing near its energetic limits. We note that 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:

For the Steller=s eider, sexual maturity is probably deferred to the second year (Bellrose 1987).

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 pair 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 1987, 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 5 and 8 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, 5 of 6 nests hatched while in 1993,

only 4 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 (5 of 6) of Steller=s eiders nests with eggs hatched in 1991, 20.0 percent (4 of 20) hatched in 1993 (Quakenbush et al. 1995), and 15 percent (3 of 20) hatched in 2000 (Philip Martin, Fish and Wildlife Service, pers. comm., 2000). 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:

Banded and Satellite-Tagged Alaskan Breeding Birds

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. Two of three Steller=s eiders captured near Barrow and implanted with satellite-transmitters spent the molting season on the Kuskokwim shoals, while the third molted near the Seal Islands (Philip Martin, U.S. Fish and Wildlife Service, pers. comm., 2000). Both birds that molted at Kuskokwim Shoals moved on to Bechevin Bay, while the bird that molted near the Seal Islands moved west to Nelson Lagoon and then to Izembek Lagoon.

Breeding Distribution

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). 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 1989), 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 were 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 overwinter 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 3 weeks. The majority are thought to molt in four areas along the Alaska Peninsula: Izembek Lagoon (Metzner 1993; Dau 1999a; Laubhan and Metzner 1999), Nelson Lagoon, Herendeen Bay, and Port Moller (Gill et al. 1981; Petersen 1981; Dau 1999a). 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; Day et al. 1995; Dau 1999a).

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 2000b Bent 1987, Agler et al. 1994, Larned and Zwiefelhofer 1995).

Larned (2000a) 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 that is detected during spring migration was not detected on this survey. We conclude that either the survey failed to detect many birds in the survey area, or many Steller's eiders are wintering further west in the Aleutian Islands and/or along the south side of the Alaska Peninsula. We suspect the latter.

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, Fish and Wildlife Service, pers. com. 2000). Interestingly, despite our many daytime aerial surveys, Steller's eiders have never been observed during migratory flights (William Larned pers. com. 2000). 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).

Summer Distribution in Southern Alaska

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, U.S. Fish and Wildlife Service, pers. comm. 2000).

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 124 m 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; Martin, Service, Ecological Services, Fairbanks, 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. 2000).

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).

Limited observations suggest repeated use of winter habitats by Steller=s eiders (LGL 2000a, LGL 2000b), although we do not know if these observations indicate repeated use of winter habitats by the same birds (which would indicate site fidelity for wintering habitat). However, 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 Delta and the Arctic Coastal Plain (approximately 500 miles), and 2) the anticipated site fidelity of nesting adult females (Anderson et al. 1992). The similarly distributed North Slope and Yukon-Kuskokwim 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 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 balthica*), 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), 4 species of bivalves (18.5%); 12 species of crustaceans (13%); and 2 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 (Quackenbush 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 5 adult male and 3 adult female Steller=s eiders taken by avian predators in 4 years near Barrow. Predators included peregrine falcons, gyrfalcons, and snowy owls. In addition, pomarine jaegers preyed on Steller=s eider eggs. On the Yukon-Kuskokwim Delta, Steller=s eider nests have been destroyed by gulls (Paul Flint, pers. comm., 1999).

Population dynamics

Population Size:

Yukon-Kuskokwim Delta

Estimating the size of the Steller=s eider breeding population in Alaska has proved difficult. Due to the low counts and high variation in counts between years during systematic surveys, an accurate/precise statistical estimate is unavailable. Aerial surveys which included the Yukon-Kuskokwim 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 may 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 Yukon-Kuskokwim Delta prior to 1990.

Recent breeding attempts on the Y-K Delta

Since publication of Kertell (1991), a few pairs of Steller=s eiders have nested on the Yukon-Kuskokwim Delta (Table 1) (Paul Flint, 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 Yukon-Kuskokwim 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) 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 ABarrow 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 two different years and derived two quite different visibility correction factors based upon each year=s data. Despite attacking the problem of Steller=s eider population estimation from many different angles, our collective efforts have shed little light on which method result 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 that are most intimately 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 (Mallek and King 1999).

Year	Location	Number Seen	Population Estimate	95% Confidence Interval
1989	ACP	NI	2,002	NI
1990	ACP	NI	534	NI
1991	ACP	NI	1,118	NI
1992	ACP	NI	954	NI
1993	ACP	NI	1,313	NI
1994	ACP	NI	2,524	NI
1995	ACP	NI	931	NI
1996	ACP	NI	2,543	NI
1997	ACP	NI	1,295	NI
1998	ACP	NI	281	NI
1999	ACP	NI	1,250	NI

ACP-Arctic Coastal Plain
 NI-Not indicated

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

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Year	Location	Number Seen	Population Estimate	95% Confidence Interval	Researcher(s)
1992	ACP	0	0	NA	Larned and Balogh (1996)
1993	ACP	11	263	11-713	Larned and Balogh (1996)
1994	ACP	4	91	4-215	Larned and Balogh (1996)
1995	ACP	14	322	14-725	Larned and Balogh (1996)
1996	ACP	0	0	NA	Larned and Balogh (1996)
1997	ACP	8	189	8-432	Larned et al. (1999)
1998	ACP	0	NA	NA	Larned et al. (1999)
1999	ACP	31	NI	NI	Larned pers. comm. 2000
2000	ACP	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 error around our population estimates are large enough to obscure relatively large annual population fluctuations. However, ground-based efforts in the Barrow area suggest that 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 2000a). In addition, comparison of banding data from 1975 -1981 to that from 1991-1997 indicate a reduction in Steller's eider survival over time (Flint et al, 2000). If population models for other waterfowl may be applied to this species, the observed reduction in annual survival over time would have a substantial negative effect on population dynamics (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 (Fish and Wildlife 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 (Fish and Wildlife Service 1997).

Habitat Loss

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

Hunting

Although not cited as a cause in the decline of Steller's eiders, the take of this species by subsistence hunters was cited as a threat to the population of Steller's eiders near Barrow in the final rule (Fish and Wildlife Service 1997). However, the gathering of subsistence harvest information similar to that collected from Natives on the Y-K Delta has met with resistance from Natives on the Arctic Coastal Plain.

Predation

Increased predation by arctic foxes (*Alopex lagopus*) resulting from the concurrent crash of goose populations is cited as a possible contributing factor to the decline of the Steller's eider on the Yukon-Kuskokwim Delta (Fish and Wildlife 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 (Fish and Wildlife Service 1997).

Lead Poisoning

The presence of lead shot in the nesting environment on the Yukon-Kuskokwim Delta was cited as a continuing potential threat to the Steller=s eider. The Service is progressing in its efforts to enforce a nationwide ban on lead shot on the Arctic Coastal Plain (Fish and Wildlife 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 (*Enhydra 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 (Fish and Wildlife 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 (Fish and Wildlife 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). The imprecision of our breeding ground estimates precludes us from detecting any but the most obvious population trends. 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 large number of Steller=s eiders which were 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 have been found to be existing 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' prey (e.g., amphipods and snails) (Newey and Seed 1995 as in Glegg et al. 1999, Finley et al. 1999), and to the species itself (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). Therefore, we believe that spilled petroleum is likely to adversely affect Steller's eiders.

Higher 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 the risk of exposure to lead shot consumption 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 Yukon-Kuskokwim 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 and other structures. During a 4-year period near Barrow, 1 adult Steller's eider female was documented to have 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. Finally, we have had at least one report from a fishery observer of Steller's eiders becoming both injured and dying due to striking a fishing vessel. The actual number of birds injured and killed through collisions with manmade structures is likely higher. We believe that many injured and killed birds go undetected, unreported, or become scavenged before they are detected by humans.

Stochastic Events

The small population size of the Steller's eiders on the Yukon-Kuskokwim Delta and the Arctic Coastal Plain, may put them at risk of the deleterious effects of demographic and environmental

stochasticity. Demographic stochasticity refers to random events that effect 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 are 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 (\pm SE) for females and 0.765 " 0.044 (\pm 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 percent of the males will survive for 10 years.

The observed difference in annual survival between sexes may be manifesting itself in the skewed sex ratio of Steller=s eiders observed during the winter of 1999/2000. Female Steller=s eiders notably out-numbered males 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. com. 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 effect this species. Adverse effects may occur due to the loss of foraging habitat and the release of petroleum associated with vessels using the harbor.

Proposed critical habitat for Steller=s eiders occurs within the action area of the project. Critical habitat was proposed for the Steller=s eider on March 13, 2000 (65 FR 13262). Construction of the harbor will result in the loss of proposed critical habitat. However, the 6.7 ha of habitat that is anticipated to be lost due to this proposed project falls far short of what we consider to be adverse modification of critical habitat for Steller=s eiders.

Because of the pelagic nature of the short-tailed albatross, and the location of the proposed harbor (i.e., short-tailed albatross do not rely on the harbor site), we do not believe construction of the harbor is likely to adversely affect this species.

Environmental Baseline

Regulations implementing the Act (50 CFR '402.02) define the environmental baseline as the past and present impacts of all Federal, State, or private actions and other human activities in the action area *to the listed species*. Also included in the environmental baseline are the anticipated impacts of all proposed Federal projects in the action area *to the listed species* that have undergone section 7 consultation, and the impacts of State and private actions which are contemporaneous with the consultation in progress. The action area includes all areas to be affected directly or indirectly by the Federal action and not merely the immediate area involved in the action. Following, is a description of past and present human activities in the action area which are impacting Steller=s and spectacled eiders.

Status of the species within the action area

The action area of the proposed project coincides with the wintering habitat of the Steller=s eider. In addition, migrating Steller=s eiders are also anticipated to use the site during migration. Surveys conducted during the winter of 1999/2000 indicated at least 114 Steller=s eiders were using waters at False Pass (LGL 2000a). In addition, Steller=s eiders were observed to forage and roost within and adjacent to the proposed harbor site (range 14 to 32) (LGL 2000a). The project site was used consistently by Steller=s eiders during all surveys, and we noted that 69% of eiders in this area were females (LGL 2000a). Due to the probable presence of transient and migrating birds moving through the area, we consider 32 Steller=s eiders to be the minimum estimate of the number of Steller=s eiders actually using the project site.

The number of Steller=s eiders in the action area of the proposed project that are actually of the listed entity will be estimated by assuming that 3.0 percent of all Steller=s eiders observed there are from the Alaska breeding population. This estimate derives from the assumption that Steller=s eiders from the Alaska population are randomly distributed amongst the total population of Steller=s eiders overwintering in Alaska. The percentage estimate was calculated using the total estimated number of overwintering Steller=s eiders from the three most recent spring migration surveys (82,560 birds) (Larned 2000b), and the highest estimate of nesting Alaskan birds (2,524 birds) (Table 2).

The high estimate for Steller=s eiders breeding in Alaska is being used so we do not inadvertently underestimate the total number present (i.e., underestimate the number at risk). We recognize that gender related behaviors during pairing and a tendency towards site tenacity may result in some distributional differences between genders of this species. In general, we expect that it is more likely that male Steller=s eiders fledged from Alaskan breeding grounds may occur anywhere within the species range, but that female Steller=s eiders may tend to congregate within some small subset of the species entire winter range. We have no data supporting or refuting this supposition.

Factors affecting species= environment within the action area

Commercial Seafood Industry

Past and present impacts to Steller=s eiders resulting from the seafood industry presence at False Pass 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; and 4) the accidental release of petroleum through the release of contaminated bilge water or from grounded/sunk vessels.

Steller=s eiders may also collide with vessels during adverse weather conditions. We are aware of only one such fatal collision, (In February, 1997 near False Pass). However, we have searched only a small portion of fishery observer logbooks for this data.

Seafood Processor Organic Waste

Information regarding the effects of organic waste from seafood processors at False Pass is apparently not available. However, the release of seafood processor waste is currently authorized by the Environmental Protection Agency for the Bearing Pacific Seafood processor, Dipper, (AKG52-0506). The Dipper is located in near-shore waters at False Pass where Steller's eiders have been observed roosting and foraging. Given the near-shore currents in the area, organic waste may be drawn into an area where Steller's eiders were observed to have foraged during the winter of 1999/2000 (LGL 2000a). As such, if organic waste from the seafood processor collects in the near-shore environment, foraging habitat of the Steller's eider may be degraded and birds reliant on that area may be subsequently harmed through a reduction in food availability.

Petroleum Spills

Four petroleum spills have been reported at False Pass over the last 10 years. The average spill size at False Pass was 15.5 gallons (range 2.5-100 gallons) (Day and Pritchard 2000). The accidental release of petroleum products into the marine environment at False Pass is anticipated to continue. As discussed previously, releases of petroleum into habitat occupied by Steller's eiders can be harmful. However, at this time, we do not know what effect the spills at False Pass have had on Steller's eiders.

Hunting

We don't know whether Steller's eiders are taken by subsistence hunters within the action area. However, the presence of spent shotgun shells along the shoreline (Arthur Davenport, Fish and Wildlife Service, pers. obs. 2000), suggest that waterfowl hunting occurs there.

Effects of the action

The 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 (51 FR 19958; 50 CFR Part 402). Indirect effects are those that are caused by the proposed action and are later in time, but still are reasonably certain to occur. In this case, the action is the proposed construction and operation of a harbor at False Pass, Alaska.

Factors to be considered

Proximity of the action:

The proximity of the action to the species must be determined in evaluating the direct and indirect effects of the proposed action. As such, defining the action area of a proposed action is basic to analyzing the effects of the action. The action area should be determined based on

consideration of all direct and indirect effects of the proposed agency action [50 CFR 402.02 and 402.14(h)(2)]. For the proposed harbor project, the action area includes all areas that may be effected directly or indirectly by construction and operation of the harbor. This area includes areas that may be effected by interrelated or interdependent activities.

For the harbor project, the direct areas to be effected coincide with the footprint of the harbor. In addition, the area(s) effected due to the pattern of vessel traffic that results from the presence of the harbor location, and the area at risk of exposure to petroleum spills due to the presence of the harbor, are also considered to be part of the action area.

Determining the area at risk due to petroleum spills is difficult. Currents and prevailing winds associated with the location of the project must be considered because they may affect the size and shape of an area that may be effected due to the operation of the harbor.

Assuming a tidal current of just 1 knot, a petroleum spill may move approximately 4 nautical miles (nm) (4.6 statute miles) between one set of tidal extremes (high to low, or low to high). For diesel fuel spilled during a 5 knot wind and into water of temperatures typical for Alaska, 69 percent of the material will remain 4 hours into the spill event (Attachment 1).

Currents generated at the water surface from wind are approximately 3 percent of the wind speed (U.S. Fish and Wildlife Service, unpub. info.). At a wind speed of 15 knots (17.25 miles per hour), the spill will move approximately 45 feet per minute. Thus, the spill may move approximately 1.8 miles in 4 hours pushed by wind alone, and there will be about 65 percent of the material remaining at that time (Attachment 1). Wind speeds of 30 knots are not uncommon within the action area. Such wind would move spilled product on the surface nearly 4 nm in 4 hours.

In False Pass, tidal current speeds of approximately 4 nm per hour are not uncommon (ACOE 2000a) (4.6 statute miles/hour). However, the proposed harbor would be located in what appears to be an eddy of lower current speed. Given our information on tidal currents, wind speed, and other factors, we believe that 4 nm (4.6 statute miles) from the center of the harbor is a conservative radial measure to use in defining the action area for the proposed harbor. Thus, the action area is comprised of the harbor itself, land that is occupied by facilities that are directly associated with harbor operation, and marine waters within 4 nm of the center of the harbor.

Distribution:

The geographic area of the proposed harbor project coincides with habitat used by wintering and migrating 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 the loss and degradation of Steller=s eider foraging areas. Construction of the harbor will result in the direct loss of habitat where Steller=s eiders were observed to forage consistently during the winter of 1999/2000. In addition, the accidental release of petroleum products from vessels associated with the harbor are anticipated. As previously discussed, accidental petroleum releases can adversely effect 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.

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 effect 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. As discussed previously, 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 form 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) and 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. In fact, 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), suggesting that, in some cases, alternative foraging areas of sufficient quality are not available for wintering eiders. In short, 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

Assumptions and approach used in assessing impacts:

We have little information on the home range size of Steller=s eiders during winter, however we do have such data for the harlequin duck, a species that is similar in size and foraging behavior, and seems to use habitat types similar to that used by Steller=s eiders. Harlequin ducks seem to have both a resident and transient component to their population (Robertson 1997, Robertson et al. 1999). In addition, winter resident harlequin ducks use very specific stretches of shoreline (Robertson et al. 1999). Resident birds typically remained within a 5 km area, eliciting selection preferences for certain habitat types or locations. For example, a female that was observed 22 times over the winter was never seen outside a 1,100 meter stretch of shoreline, and 18 of the 22 sightings were within a 320 meter section of shoreline (Robertson et al. 1999). However, juvenile and unpaired male harlequin ducks seem to be much more mobile (Robertson et al. 1999), and periodic counts of males at a particular location on any day may represent only a portion of the males that use that habitat. The transient juvenile and unpaired male component of the population moves between areas of suitable habitat beyond a distance of 5 km (Robertson et al. 1999). However, once these males establish a pair bond, they remain with the females in traditional use areas. We do not know if similar site fidelity patterns are exhibited by Steller=s eiders, but without evidence to the contrary, we may assume that some similarities with regard to the scale of habitat use do exist.

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.

We are assuming that 3.0 percent of all Steller=s eiders observed on the wintering grounds in Alaska are from the 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 (2,524 birds) (Table 2). We recognize that there is some bias in this estimate because both population estimates are negatively biased (both are conservative estimates). However, we do not know which individual estimate (wintering population or breeding population) has the greater negative bias. Thus, to some unknown extent, the biases cancel each other out.

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, measures included with the project description will likely minimize its affect on this threatened species. Such measures include:

- 1) use of silt curtains and/or construction timing windows to reduce turbidity;
- 2) the placement of receptacles for waste oil at the new harbor;
- 3) implementation of a plastic/nylon mesh recovery effort to eliminate fishing nets and other wildlife-entanglement hazards along 3 miles of shoreline immediately north of the False Pass harbor during the construction year.
- 4) installation of eye bolts at the entrance channel and breaches for rapid attachment of spill containment booms;
- 5) follow up surveys for Steller=s eiders.

Direct effects:

The construction of the harbor will result in a permanent loss of 6.7 hectares 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. We do not believe that the destruction of 6.7 ha that is expected to result from this proposed project will result in the adverse modification of proposed critical habitat.

Interrelated and interdependent actions:

The location and operation of the harbor will presumably influence the location and number of vessels using waters within the immediate area. Potential adverse effects resulting from these vessels, vessels that would not be there but for the presence of the harbor, must be included in our analysis of the effects of the proposed action. Although the number of vessels associated with False Pass is not anticipated to increase (ACOE 2000a), the new harbor may change spatial and temporal distribution of vessels. Thus, although the harbor may not change the amount of environmental contamination that results from these vessels, it may change where and when this contamination occurs. We are particularly concerned with the change in spatial distribution of contamination resulting from release of petroleum-contaminated bilge water.

| At least 114 Steller=s eiders are known to use the False Pass area during winter (LGL 2000a).

Among other risks present in the area, these eiders may be susceptible to releases of petroleum-contaminated bilge water. Because we estimate that 3.0 percent of the Steller=s eiders in the wintering population also belong to the Alaska breeding population, and because we know that at least 114 Steller=s eiders use waters in the vicinity of the proposed harbor site, we therefore estimate that three Steller=s eider belonging to the listed entity may be taken annually through the interrelated and interdependent effects of this proposed action.

Indirect Effect:

The operation of the proposed harbor is likely to negatively impact Steller=s eiders. Steller=s eiders may be at risk of take through contact with spilled petroleum within the harbor. They may also ingest mollusks and marine crustaceans that have been contaminated with, and may be bio-accumulating (Rand and Petrocelli 1985) petroleum as a result of the presence of the harbor. In addition, eiders may suffer from reduced foraging opportunities if petroleum contamination reduces prey availability.

We assume that Steller=s eiders using waters adjacent to the proposed harbor may be susceptible to indirect effects resulting from petroleum spilled within the harbor. Due to the concentration of vessels at this site resulting from the presence of the harbor, the risk of eiders encountering spilled petroleum here may be greater than for other areas where vessels do not concentrate. Because we estimate that 3.0 percent of the Steller=s eiders in the wintering population also belong to the Alaska breeding population, and because we know that at least 32 Steller=s eiders use waters immediately adjacent to the proposed harbor site, we therefore estimate that approximately one Steller=s eider belonging to the listed entity may be taken annually through the indirect effects of this proposed action.

Species= response to a proposed action

Numbers of individuals/populations in the action area affected:

Limited surveys have indicated that at least 32 Steller=s eiders use waters within the footprint of this proposed project, and 114 Steller=s eiders use waters that are within the action area that is likely to 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 likely that our limited 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 to forage in close proximity to human structures/habitation. 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 2000). 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 there appears to be an sex ratio present in this species that is atypical for sea ducks (See Aallee 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. We have observed such gear in

the vicinity of the proposed project (Arthur Davenport, Fish and Wildlife Service, pers. obs. 2000). 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 eider, 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. No critical habitat has been designated for this species; therefore, none will be affected. The US Army Corps of Engineers did not request conferencing on the effects of the action on the critical habitat that was proposed for the species, however we have concluded that this action will not adversely modify or destroy critical habitat that has been proposed for this species.

The regulations (51 FR 19958) that implement section 7(a)(2) of the Act define "jeopardize the continued existence of" as "to engage in an action that reasonably would be expected, directly or indirectly, to reduce appreciably the likelihood of both the survival and recovery of a listed species in the wild by reducing the reproduction, numbers, or distribution of that species." We have concluded that the proposed action is not likely to jeopardize the continued existence of the Alaska breeding population of Steller's eiders or adversely modify or destroy proposed critical habitat. However, we do recognize that adverse impacts may occur primarily due to the destruction of wintering habitat, change in distribution of vessels, and resulting changes in distribution of petroleum contamination, and through the effect of spilled petroleum on eiders and on their prey. We reviewed all available information on the location, timing of construction, and anticipated changes in vessel activity resulting from this proposed project, along with the anticipated effects of the proposed action; the best available information on the status, distribution, and life history of the listed Steller's eider. We have concluded that it is not reasonable to assume that a significant component of the Alaska breeding population of Steller's eiders will occur within the action area of this proposed project. While it is impossible to predict accurately the potential risk of the proposed action to the Alaska breeding population of Steller's eiders, and we cannot fully discount that a catastrophic event could occur, we do not believe that such a chain of events is reasonably certain to occur. If future information indicates that a disproportionately high percentage of birds of the listed entity use the waters affected by this project, then it is incumbent upon the U.S. Army Corps of Engineers to reinitiate consultation on this project.

INCIDENTAL TAKE STATEMENT

Section 9 of the ESA and Federal regulation pursuant to section 4(d) of the ESA 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 U.S. Fish and Wildlife 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 U.S. Fish and Wildlife 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 ESA 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 ACOE so that they become binding conditions of any grant or permit issued to an applicant, as appropriate, for the exemption in section 7(o)(2) to apply. The ACOE has a continuing duty to regulate the activity covered by this incidental take statement. If the ACOE (1) fails to assume and implement the terms and conditions or (2) fails to require the 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 the incidental take, the ACOE or applicant must report the progress of the action and its impact on the species to us as specified in the incidental take statement [50 CFR 402.14(I)(3)]. The following reasonable and prudent measures, as well as their associated terms and conditions, should significantly minimize such taking.

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

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.

In anticipating incidental take levels associated with the proposed project we have separately identified two distinct forms of take: 1) that which is related to the amount of habitat taken due to construction of the harbor, and 2) that which is related to the take caused by oil spills

associated with use of the harbor.

Take Related to Harbor Construction

The Service expects that construction of the harbor will result in take in the form of a permanent loss of 6.7 hectares of near-shore habitat known to be used by wintering Steller=s eiders. The take is expected to be in the form of harm resulting from the permanent loss of this wintering habitat because harbor construction will substantially alter or destroy the biota in this area that is currently used by eiders.

Take Related to Petroleum Releases

The Service anticipates that accidental petroleum releases will occur in association with the operation of the harbor. This recognition by the Service; however, does not legitimize an otherwise illegal act, that of releasing petroleum into the environment. Nevertheless, the proposed project will concentrate vessels within habitat used by Steller=s eiders, and petroleum spills associated with these vessels can be reasonably expected to occur.

We assume that Steller=s eiders using waters adjacent to the proposed harbor may be susceptible to effects resulting from petroleum spilled within the harbor. Due to the concentration of vessels at this site resulting from the presence of the harbor, the risk of eiders encountering spilled petroleum here may be greater than for other areas where vessels do not concentrate. Because we estimate that 3.0 percent of the Steller=s eiders in the wintering population also belong to the Alaska breeding population, and because we know that at least 32 Steller=s eiders use waters immediately adjacent to the proposed harbor site, we therefore estimate that approximately one Steller=s eider belonging to the listed entity may be taken through the indirect effects of petroleum released within the harbor itself. This take is expected to be in the form of harm.

In addition to the take caused by release of petroleum within the harbor itself, we expect some take caused by release of petroleum in the vicinity of the harbor, but which would not likely have occurred there but for the harbor. Because we estimate that 3.0 percent of the Steller=s eiders in the wintering population also belong to the Alaska breeding population, and because we know that at least 114 Steller=s eiders use waters in the vicinity of the proposed harbor site (perhaps best described as the False Pass area), we therefore estimate that three Steller=s eider belonging to the listed entity may be taken annually as a result of illegal petroleum releases associated with this project. This take is also expected to be in the form of harm.

Future research may enable us to distinguish birds of the listed entity from those not protected under the Act while the birds are mixed on their wintering grounds. However, because we do not yet have the ability to make such distinctions, we have quantified our expected take assuming scenarios in which 1) we are unable to distinguish listed birds from other Steller=s eiders, and 2) such distinctions are possible.

Therefore, we expect the following levels of take resulting from petroleum releases:

1) Harm to 32 Steller=s eiders as a result (either direct or indirect) of petroleum releases that occurred within the harbor,

OR

Harm to 1 Steller=s eider that is known to be of the listed population where such harm is a result (either direct or indirect) from petroleum releases that occur within the harbor (note: this relates to harm expected to be caused on an annual basis);

2) Harm to 114 Steller=s eiders as a result (either direct or indirect) of petroleum releases that occurred within the False Pass area, and these releases can reasonably be attributed to a vessel or vessels being present in the area due to the presence of the harbor,

OR

Harm to 3 Steller=s eiders known to be of the listed population where such harm is a result (either direct or indirect) of petroleum releases that occurred within the False Pass area, and these releases can reasonably be attributed to a vessel or vessels being present in the area due to the presence of the harbor (note: this relates to harm expected to be caused on an annual basis);

Effect of the take

We determined that the level of take associated with the construction and operation of the proposed harbor is not likely to result in jeopardy to the species or destruction or adverse modification of proposed critical habitat.

Reasonable and Prudent Measures

The U.S. Fish and Wildlife Service believes the following reasonable and prudent measures are necessary and appropriate to minimize impacts of incidental take of Steller=s eiders:

- 6) The ACOE shall minimize the potential for impacts to Steller=s eiders during construction of the harbor.
- 7) The ACOE shall minimize the potential for impacts to Steller=s eiders during operation of the harbor.
- 8) The ACOE 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, ACOE 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.

9. The following terms and conditions shall implement Reasonable and Prudent Measure No. 1.
 - 9.1_ The ACOE shall shift the location of the harbor as far to the south as practicable to avoid placement of construction materials upon substrate documented as having been used by Steller=s eiders. Lacking an alternative plan that will accomplish this, the ACOE shall shift the harbor 50 feet to the south of the position indicated in Plan 1-E, the locally preferred alternative (COE 2000), and shall modify the northeast corner of the harbor so the toe of the breakwater does not coincide with documented Steller=s eider feeding habitat.
 - 9.2_ The ACOE shall ensure that fully-functional siltation curtains are used during construction of the harbor to reduce impacts to adjacent Steller=s eider habitat.
 - 9.3_ The ACOE 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 October 1 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 Ecological Services Anchorage Field Office. The ACOE shall immediately notify the Field Office of the presence of any Steller=s eider that is observed from the area of construction during construction.
10. The following terms and conditions shall implement Reasonable and Prudent Measure No. 2.
 - 10.1_ The ACOE shall ensure that properly-sized oil booms, in a theft-proof storage container are permanently staged at the harbor for the fish passages and entrance channel to help minimize or prevent petroleum that is spilled within the harbor from escaping the confines of the harbor. In the Project Cooperation Agreement, the ACOE will require the local project sponsor to implement and continue to carry out the terms of this condition.
 - 10.2_ The ACOE shall implement a plastic/nylon mesh recovery effort to eliminate fishing nets and other wildlife-entanglement hazards along 3 miles of shoreline immediately north of False Pass harbor during the calendar year of harbor construction. The ACOE will require the local sponsor, through the Project Cooperation Agreement, to address this requirement in its harbor management plan.
 - 10.3_
11. The following term and condition shall implement Reasonable and Prudent Measure No. 3.

- 3.1 The ACOE shall monitor the releases of petroleum at the harbor for one year prior to harbor construction, for the entire calendar year of Harbor construction, and for one full year after vessels begin using the completed harbor. Passive monitoring devices such as lipid bags shall be employed, and shall be placed within and outside of the harbor, and subsequently collected and analyzed. The ACOE shall coordinate with the U.S. Fish and Wildlife Service on the study design for this monitoring effort prior to its initiation. A summary report shall be submitted to the Service annually.
- 3.2 The collision of Steller=s eiders with physical structures associated with the operation of the harbor shall be monitored. Eiders that have been injured or killed by colliding with harbor-related structures shall be immediately reported to the Ecological Services Anchorage Field Office (see contact information below). Information 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. The ACOE shall require the local sponsor, through the Project Coordination Agreement, to 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. The ACOE shall require the local sponsor, through the Project Coordination Agreement, to coordinate with the Service on the design and placement of notices urging the public to report injured Steller=s eiders. The ACOE shall require the local sponsor, through the Project Coordination Agreement, to cover the expenses associated with the printing and maintenance of these notices, and shall 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 All lighting that is associated with the operation of the proposed harbor shall be shielded in such a way as to minimize the hazard of disorienting flying birds and causing them to strike fixed objects. The ACOE shall coordinate with the Service on the specifications for shielding lighting to be installed by the local sponsor. The local sponsor will agree, in the Project Cooperation Agreement, to incorporate such specifications.
- 3.4 The ACOE shall continue to monitor Steller=s eider use of waters near the action area following a survey design agreed upon between the ACOE and the Service. Surveys shall be conducted once per month in January, February and March

during the calendar year immediately prior to construction, during the calendar year of construction, and for the two calendar years after vessels begin using the completed harbor. If, after 3 years of monitoring (including the calendar year 2000 survey), Steller=s eiders have never remained in the project vicinity in March, the March survey can be dropped. The ACOE will require the local sponsor, in the Project Coordination Agreement, to provide for the surveys in the two post-construction seasons using the survey design agreed upon and used in previous years. A summary report shall be submitted to the Service annually.

Contact Information

When attempting to contact the Ecological Services, Anchorage Field Office, please call the numbers below until:

- 1) direct contact has been made with a person, or
- 2) voice mail messages have been left at each number with information on the nature of the call and how we may contact the caller.

The following numbers should be called in the order indicated:

Ecological Services toll free number:	1-800-272-4147
Endangered Species Program:	907-271-2778
Field Supervisor:	907-271-2787
Endangered Species Biologist (24 hours):	907-345-9899

Summary reports shall be submitted to:

Ann G. Rappoport
Field Supervisor
U.S. Fish and Wildlife Service
Ecological Services, Anchorage Field Office
605 W. 4th Ave, Rm G-61
Anchorage, AK 99501

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: (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; or (4) a new species not covered by this opinion is listed or critical habitat designated that may be affected by this action. In instances where the amount or extent of incidental take is exceeded, any operations causing

such take should cease pending reinitiation.

The Service believes that no more than 6.7 ha of habitat and 4 Steller=s eiders of the listed entity will be incidentally taken as a result of the proposed action. The reasonable and prudent measures, with their implementing terms and conditions, are designed to minimize the impact of incidental take that might otherwise result from the proposed action. If, during the course of the action, any of the following levels of incidental take are exceeded, such incidental take represents new information requiring reinitiation of consultation and review of reasonable and prudent measures provided:

- Direct loss of eider habitat due to harbor construction exceeds 6.7 ha;
- More than 32 Steller=s eiders are harmed in any given year as a result (either direct or indirect) of petroleum releases that occurred within the harbor;
- More than 1 Steller=s eider that is known to be of the listed population is harmed in any given year as a result (either direct or indirect) of petroleum releases that occur within the harbor;
- More than 114 Steller=s eiders are harmed in any given year as a result (either direct or indirect) of petroleum releases that occurred within the False Pass area, and this release can reasonably be attributed to a vessel or vessels being present in the area due to the presence of the harbor;
- More than 3 Steller=s eiders known to be of the listed population are harmed in any given year as a result (either direct or indirect) of petroleum releases that occurred within the False Pass area, and this release can reasonably be attributed to a vessel or vessels being present in the area due to the presence of the harbor;

The Federal agency must immediately provide an explanation of the causes of the taking and review with the Service the need for possible modification of the reasonable and prudent measures.

If you have any questions concerning this biological opinion, please contact Field Supervisor Ann Rappoport at (907) 271-2787, or lead Endangered Species Biologist Greg Balogh at (907) 271-2778.

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Attachment 1. Spill Scenarios-Oil budget Tables

Oil name = Diesel Fuel Oil (Alaska)

API = 38.8;

Water Temperature - 40 degrees F

Total Amount of Oil Released = 1,000 gallons

Pour Point = -33 degrees F

Wave Height = Computed from Winds

Wind Speed - Constant at 5 knots

Hours Into Spill	Released Gallons	Evaporated Percent	Remaining Percent	Hours Into Spill	Released Gallons	Evaporated Percent	Remaining Percent
1	1,000	13	87	54	1,000	60	40
2	1,000	23	77	60	1,000	61	39
4	1,000	31	69	66	1,000	61	39
6	1,000	36	64	72	1,000	62	38
8	1,000	39	61	78	1,000	63	37
10	1,000	41	59	84	1,000	63	37
12	1,000	43	57	90	1,000	64	36
18	1,000	48	52	96	1,000	64	36
24	1,000	51	49	102	1,000	65	35
30	1,000	54	46	108	1,000	65	35
36	1,000	56	44	114	1,000	65	35
42	1,000	58	42	120	1,000	66	34
48	1,000	59	41				

Wind Speed = Constant at 10 knots

Hours Into Spill	Released Gallons	Evaporated Percent	Dispersed Percent	Remaining Percent
1	1,000	8	1	91
2	1,000	14	2	84
4	1,000	20	3	76

6	1,000	24	5	71
8	1,000	27	7	66
10	1,000	29	9	62
12	1,000	31	10	59
18	1,000	34	15	50
24	1,000	37	20	43
30	1,000	39	25	35
36	1,000	41	30	29
42	1,000	43	35	22
48	1,000	44	40	16
54	1,000	45	44	11

Wind Speed = Constant at 15 knots

Hours Into Spill	Released Gallons	Evaporated Percent	Dispersed Percent	Remaining Percent
1	1,000	10	3	88
2	1,000	16	6	78
4	1,000	23	12	65
6	1,000	27	19	55
8	1,000	29	25	46
10	1,000	31	31	38
12	1,000	32	38	30
18	1,000	35	54	10