INTRA-SERVICE BIOLOGICAL OPINION

for

U.S. Fish & Wildlife Service

Migratory Bird Management's Project

Greater White-fronted Goose Banding and Avian Influenza

Surveillance on the North Slope of Alaska

in

2010

Table of Contents

List of Figures

1. INTRODUCTION

This document is the U.S. Fish and Wildlife Service's (Service) Biological Opinion (BO) on a proposal by the Service's Migratory Bird Management (MBM) Office to conduct survival monitoring and sampling for avian influenza in greater white-fronted geese (*Anser albifrons frontalis*) on the western North Slope in summer 2010. This BO describes the effects of these actions on Steller's (*Polysticta stelleri*) and spectacled eiders (*Somateria fischeri*), and polar bear (*Ursus maritimus*) pursuant to section 7 of the Endangered Species Act (Act) of 1973, as amended (16 U.S.C. 1531 et seq.). There is no designated critical habitat within the Action Area.

Final project details were received on April 20, 2010, and formal consultation began on that date. The complete administrative record for this consultation is on file at the Service's Fairbanks Fish and Wildlife Field Office.

The project will be based out of Deadhorse, Alaska. From here eight staff will be transported to four banding station locations in the vicinity of Teshekpuk Lake. At each site, three Cessna 206 aircraft equipped with amphibious floats will slowly herd flocks of geese off lakes onto shore where field crews will corral the flock into a large holding pen for sampling and banding.

Section 7(a)(2) of the Act states that Federal agencies must ensure their activities are not likely to:

- Jeopardize the continued existence of any listed species; or
- Result in the destruction or adverse modification of designated critical habitat.

We anticipate that the probability of encountering polar bear (*Ursus maritimus*) during the project will be very low because the proposed study sites are located ≥10 miles inland from the coast, field work will be limited to 3 days in July 2010, and there will be no field camp. Additionally, MBM will follow Polar Bear Interaction Guidelines (Appendix 1) developed in cooperation with the Service's Marine Mammals Management Office. Implementation of these guidelines should further minimize the risk of polar bear/human interactions. Based on the low probability of a human–polar bear interaction in the Action Area and the implementation Polar Bear Interaction Guidelines, the Service concludes that the project is not likely to adversely affect polar bears and there will be no further treatment of the species in this document.

After reviewing the information provided, the status of the species, the environmental baseline, and cumulative effects, the Service concludes the proposed activities may adversely affect listed eiders but will not jeopardize either species or adversely modify critical habitat. To arrive at this non-jeopardy determination, we used a four-step approach for applying section 7(a)(2) standards. These steps were:

1. Define the biological requirements and current status of listed eiders;
2. Evaluate the relevance of the environmental baseline to the current status of listed eider populations;
3. Determine the effects of the proposed or continuing action on the species; and

4. Determine whether the species can be expected to survive with an adequate potential for recovery under the effects of the proposed or continuing action, the effects of the environmental baseline, and any cumulative effects.

2. DESCRIPTION OF THE PROPOSED ACTION

2.1 Background

Section 7(a)(2) of the Endangered Species Act, (16 U.S.C. § 1531 et seq.), requires that Federal agencies shall insure that any action authorized, funded, or carried out by such agency is not likely to jeopardize the continued existence of any threatened or endangered species, or result in the destruction or adverse modification of critical habitat. When the actions of a Federal agency may adversely affect a protected species, that agency (i.e., the action agency) is required to consult with either the National Marine Fisheries Service (NMFS) or the Service, depending upon the protected species that may be affected.

For the actions described in this document, the action agency is the Migratory Bird Management Office (MBM Office) of the U.S. Fish and Wildlife Service – Region 7. This consultation is being conducted as an intra-service consultation with the Endangered Species Branch of the Fairbanks Fish and Wildlife Field Office.

2.2 Action Area

The action area is that area in which the direct and indirect effects of the proposed action may occur.

This project will be based out of Deadhorse, AK. Four proposed banding locations have been identified on lakes within the northeast portion of the National Petroleum Reserve-Alaska (NPR-A) in the vicinity of Teshekpuk Lake (Figure 2.1). Actual banding sites may be relocated based on the distribution of greater white-fronted geese in July 2010. Final banding locations will occur between the Ikpikpuk and Colville rivers and will be ≥10 miles (16 km) inland from the Alaska coast (Julian Fischer, *pers. comm.)*. Work at each station is anticipated to disturb an area of approximately one square mile (2.59 km^2; Fischer, *pers. comm.)*. The banding stations and immediate surroundings are the action area for this portion of the study.

2.3 Project Actions

The objectives of this study are to mark a total of 1,000 geese with USFWS leg bands and collect, preserve, and process 200 paired avian influenza surveillance samples using standard techniques detailed in the Interagency Strategic Plan for Avian Influenza Surveillance in Migratory Birds. The project will take place from approximately July 12–14, 2010 on Alaska's Arctic Coastal Plain at locations between the Colville and Ikpikpuk rivers, in the vicinity of Teshekpuk Lake (Figure 2.1).

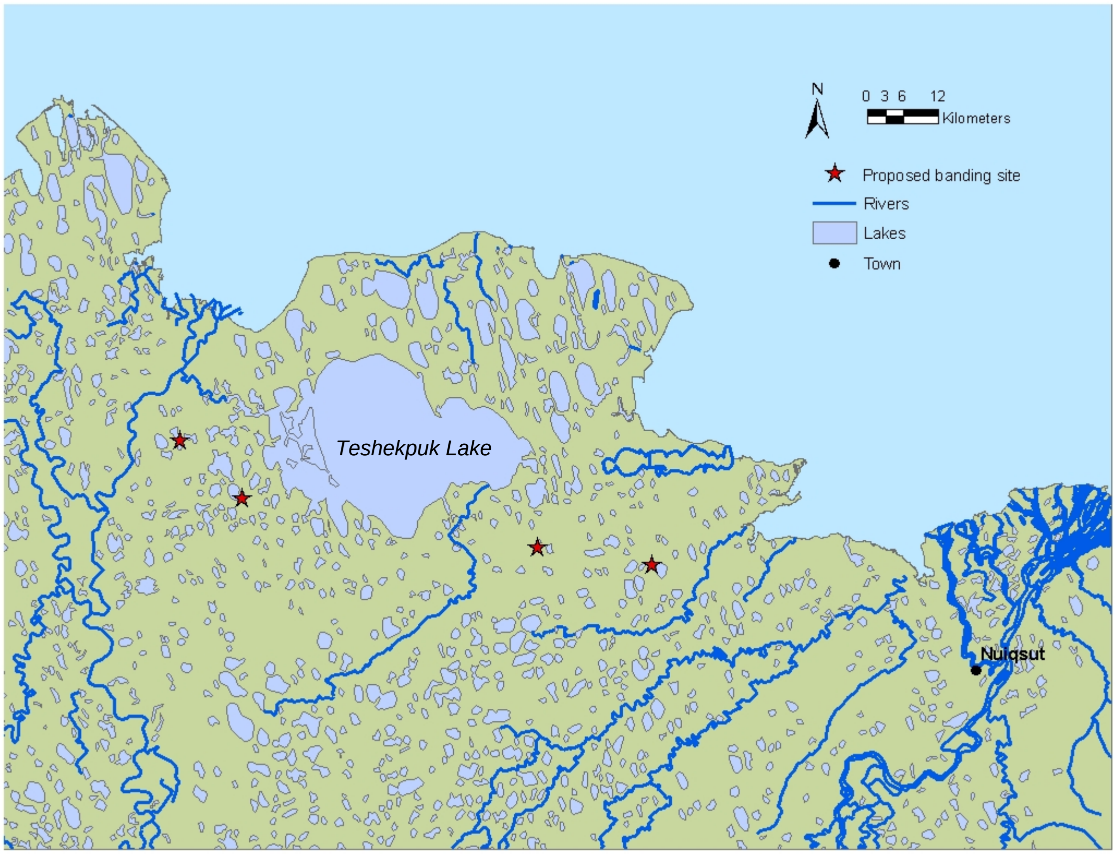


Figure 2.1. Proposed locations for greater white-fronted goose banding and avian influenza surveillance by USFWS in July 2010.

Molting concentrations of geese will be located on lakes by aerial reconnaissance. Once a suitable flock has been identified a temporary holding pen will be constructed, and three Cessna 206 floatplanes will land on the lake and slowly herd flocks towards the pen. Once the geese are onshore, field crews will corral the flock into the pen, and begin sampling and banding. It is anticipated that four banding drives at different sites will be required to capture the required 1,000 geese. Actual banding sites will be selected from the area between the Ikpikpuk and Colville rivers based on the distribution of greater white-fronted geese. Work at each station is anticipated to disturb an area of approximately 1 mi^2 (2.6 km^2).

3. STATUS OF THE SPECIES

This section presents biological and ecological information relevant to formation of the BO. Appropriate information on the species' life history, habitat and distribution, and other factors necessary for their survival is included for analysis in later sections.

3.1 Spectacled Eider

Physical Appearance
Spectacled eiders are large sea ducks. Males in breeding plumage have a white back, black breast, and pale green head with large white "spectacles" around the eyes. In late summer and autumn males molt into a mottled brown plumage that lasts until late fall, when they re-acquire breeding plumage. Females are mottled brown year round, with pale tan spectacles. Juveniles attain breeding plumage in their second (female) or third (male) year; until then they are mottled brown (Petersen et al. 2000). Both males and females have long sloped bills, giving them a characteristic profile (Figure 3.1).

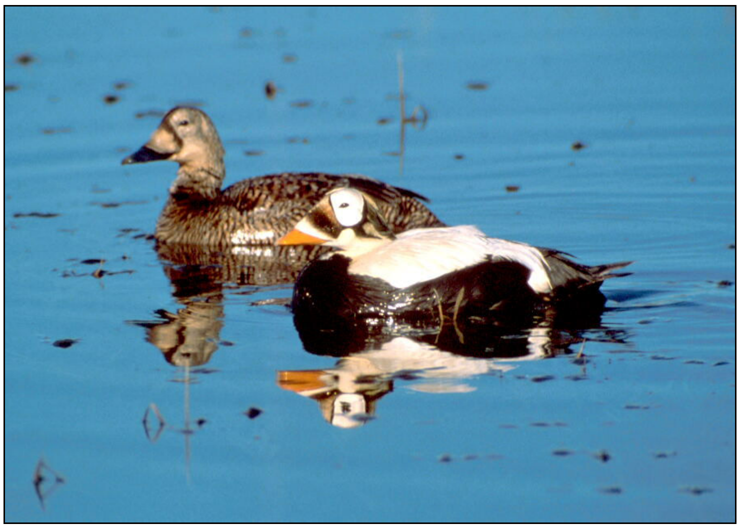
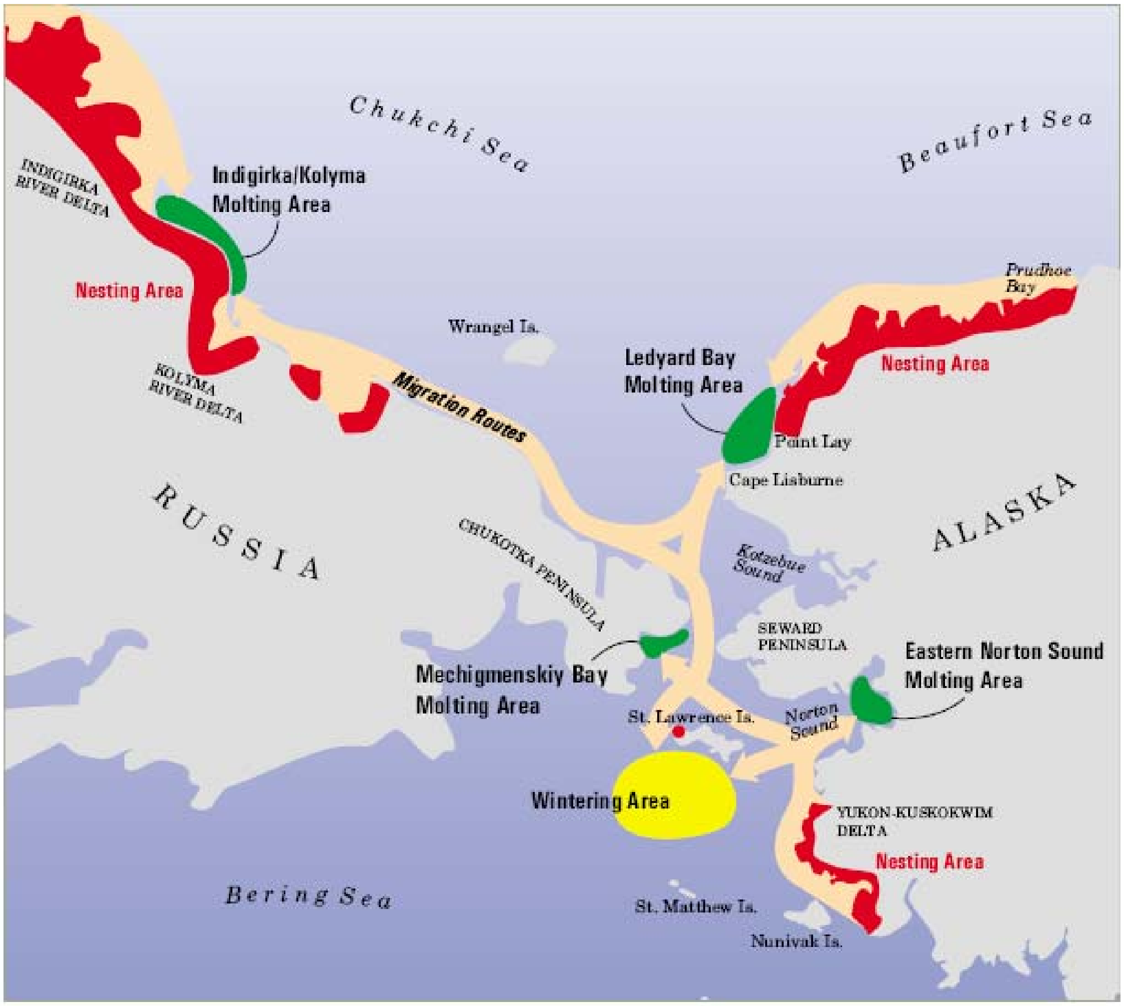


Figure 3.1 - Male and female spectacled eiders in breeding plumage.

Distribution and Status
Spectacled eiders inhabit the North Pacific. There are three primary breeding populations; those on Alaska's North Slope, the Yukon-Kuskokwim Delta (Y-K Delta), and northern Russia. The entire species was listed throughout its range as threatened on May 10, 1993 (USFWS 1993) because of documented population declines. The Y-K Delta population had declined 96% between the 1970s and early 1990s (Stehn et al. 1993, Ely et al. 1994), and anecdotal information indicated that populations in the other two primary breeding areas had also declined (USFWS 1996).

Spectacled eiders molt in several discrete areas (Figure 3.2), with birds from the different populations and genders apparently favoring different molting areas (Petersen et al. 1999). After molting, spectacled eiders migrate to openings in pack ice of the central Bering Sea south/southwest of St. Lawrence Island (Petersen et al. 1999) (Figure 3.2), where they remain until March and April (Lovvorn et al. 2003).



Distribution of spectacled eiders. Molting areas (green) are used July through October. Wintering areas (yellow) are used October through April. The full extent of molting and wintering areas is not yet known, and may extend beyond the boundaries shown.

Figure 3.2 - Distribution of spectacled eiders.

Life History – North Slope Population (Breeding)

Research and spring aerial surveys have provided data on spectacled eider populations on Alaska's Arctic Coastal Plain (ACP) (the "North Slope" breeding population) since 1992. Breeding density varies across the North Slope (Figure 3.3). Breeding pair numbers peak in mid-June and the number of males declines 4-5 days later (Smith et al. 1994, Anderson and Cooper 1994, Anderson et al. 1995, Bart and Earnst 2005).

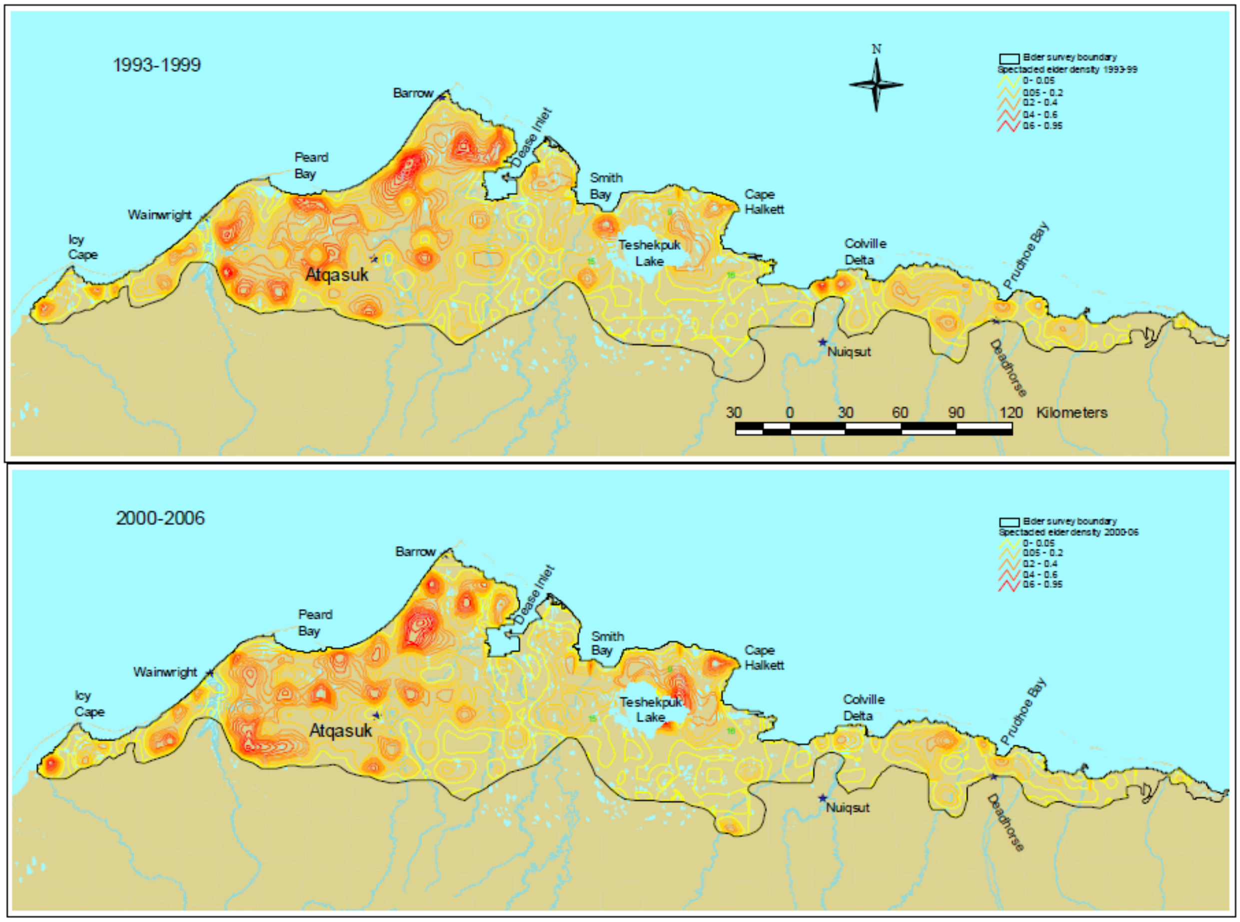


Figure 3.3 – Mean spectacled eider breeding density across Alaska's Arctic Coastal Plain 1993-1999 above and 2000 – 2006 below (from Larned et al. 2006).

North Slope spectacled eider clutch size averages 3.2–3.8, with clutches of up to eight eggs reported (Quakenbush et al. 1995). Incubation lasts 20–25 days (Kondratev and Zadorina 1992, Harwood and Moran 1993, Moran and Harwood 1994, Moran 1995), and hatching occurs from mid- to late July (Warnock and Troy 1992). On the nesting grounds, spectacled eiders feed on mollusks, insect larvae (craneflies and caddisflies), midges, small freshwater crustaceans, and plants and seeds (Kondratev and Zadorina 1992) in shallow freshwater or brackish ponds, or on flooded tundra. Young fledge approximately 50 days after hatch, and then females with broods move directly from freshwater to marine habitats.

Nest success is variable and greatly influenced by predators, including gulls (*Larus* spp.), jaegers (*Stercorarius* spp.), and red (*Vulpes vulpes*) and arctic (*Alopex lagopus*) foxes. In Arctic Russia, apparent nest success was calculated as <2% in 1994 and 27% in 1995; predation was believed to be the cause of high failure rates, with foxes, gulls and jaegers the suspected predators (Pearce et al. 1998). Apparent nest success in 1991 and 1993-

1995 in the Kuparuk and Prudhoe Bay oil fields on the North Slope varied from 25-40% (Warnock and Troy 1992, Anderson et al. 1998).

Life History – North Slope Population (Non-breeding)
Males generally depart breeding areas when the females begin incubation in late June (Anderson and Cooper 1994, Bart and Earnst 2005). Use of the Beaufort Sea by departing males is variable. Some appear to move directly to the Chukchi Sea over land, while the majority moved rapidly (average travel of 1.75 days), over nearshore waters from breeding grounds to the Chukchi Sea (TERA 2002). Of 14 males implanted with satellite transmitters, only four spent an extended period of time (11–30 days), in the Beaufort Sea (TERA 2002). Preferred areas for males appeared to be near large river deltas such as the Colville River where open water is more prevalent in early summer when much of the Beaufort Sea is still frozen.

Females generally depart the breeding grounds later, when much more of the Beaufort Sea is ice-free, allowing for more extensive use of the area. Females spent an average of two weeks in the Beaufort Sea (range 6-30 days) with the western Beaufort Sea the most heavily used (TERA 2002). Females also appeared to migrate through the Beaufort Sea an average of 10 km further offshore than the males (Peterson et al. 1999). Moving further offshore and the greater use of the Beaufort Sea by females were attributed to the greater availability of open water when females depart the area (Peterson et al. 1999, TERA 2002).

Spectacled eiders use specific molting areas from July to late October. Larned et al. (1995) and Peterson et al. (1999) discussed spectacled eiders' apparent strong preference for specific molting locations, and concluded that all spectacled eiders molt in four discrete areas (Figure 3.2). Females generally used molting areas nearest their breeding grounds. All transmittered females from the Y-K Delta molted in nearby Norton Sound (n=18), while females from the North Slope (n=15) molted in Ledyard Bay (10), along the Russian coast (4), and near St. Lawrence Island (1). Males did not show strong molting site fidelity; males from all three breeding areas molted in Ledyard Bay, Mechigmenskiy Bay, and the Indigirka/Kolyma River Delta. Males reached molting areas first, beginning in late June, and remained through mid-October. Non-breeding females, and those that nested but failed, arrived at molting areas in late July, while successfully-breeding females and young of the year reached molting areas in late August or September and remained through October.

Avian molt is energetically demanding, especially for species such as spectacled eiders that complete molt in a few weeks. Molting birds must have ample nutritious food sources, and the rich benthic community of Ledyard Bay (Feder et al. 1989, 1994a, 1994b) likely provides these for spectacled eiders. Large concentrations of spectacled eiders molt in Ledyard Bay to utilize this food resource; aerial surveys on 4 days in different years counted 200 to 33,192 molting spectacled eiders in Ledyard Bay (Petersen et al. 1999; Larned et al. 1995).

After molting, spectacled eiders migrate offshore in the Chukchi and Bering Seas to a single wintering area in openings in pack ice of the central Bering Sea south/southwest of St. Lawrence Island (Figure 3.2). In this relatively shallow area, hundreds of thousands of spectacled eiders (Petersen et al. 1999) rest and feed, diving up to 70 m to eat bivalves, mollusks, and crustaceans (Cottam 1939, Petersen et al. 1998, Petersen and Douglas 2004). Twelve spectacled eiders collected in the Bering Sea wintering area in March 2001 contained primarily the bivalve *Nuculana radiata* (Lovvorn et al. 2003).

Although migratory movements between the wintering area and the North Slope are poorly understood, it is likely that spectacled eiders follow open water in order to rest and feed en route. Recent information about spectacled and other eiders indicates that they probably make extensive use of the eastern Chukchi spring lead system between departure from the wintering area in March and April and arrival on the North Slope in mid-May or early June. Limited spring aerial observations in the eastern Chukchi have documented dozens to several hundred common (*Somateria mollissima)* and spectacled eiders in spring leads and several miles offshore in relatively small openings in rotting sea ice (William Larned, USFWS; James Lovvorn, University of Wyoming, pers. comm.). Woodby and Divoky (1982) documented large numbers of king (*Somateria spectabilis*) and common eiders using the eastern Chukchi lead system, advancing in pulses during days of favorable following winds, and concluded that an open lead is probably requisite for the spring eider passage in this region. Information obtained in 2002-2006 about 57 satellite-transmittered king eiders found that 100% of the birds migrating from the Bering Sea to breeding grounds in North America occupied the spring lead system in the eastern Chukchi (Fig. 3.4) for approximately 3-4 weeks (Steffen Oppel, University of Alaska-Fairbanks, unpubl. data).

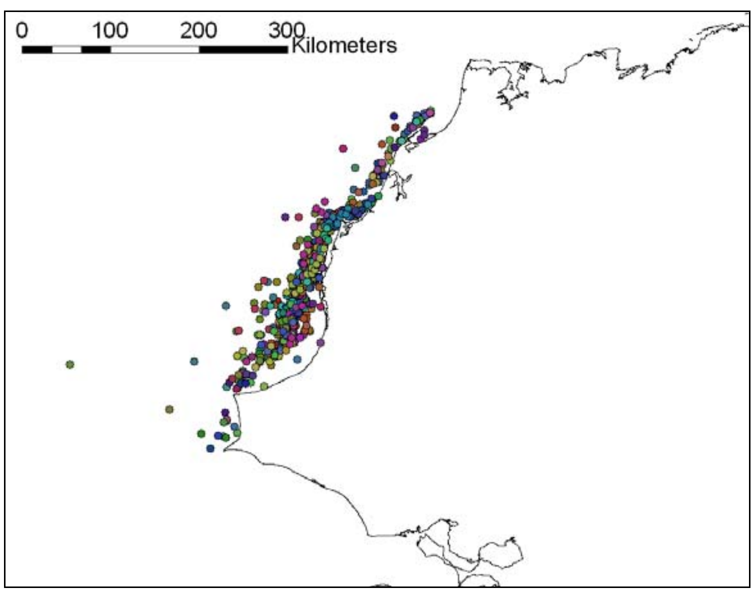


Figure 3.4. Spring migration locations of satellite-transmittered North Slope king eiders, 2002-2006 (Data from Steffen Oppel, University of Alaska-Fairbanks).

Adequate foraging opportunities and nutrition during spring migration are critical to spectacled eider productivity. Like most sea ducks, female spectacled eiders do not feed substantially on the breeding grounds, so produce and incubate their eggs while living off body reserves (Korschgen 1977, Drent and Daan 1980, Parker and Holm 1990). Clutch size, a measure of reproductive potential, was positively correlated with body condition and reserves obtained prior to arrival at breeding areas (Coulson 1984, Raveling 1979, Parker and Holm 1990). Body reserves must be maintained from winter or acquired during the 4-8 weeks (Lovvorn et al. 2003) of spring staging, and Petersen and Flint (2002) suggest common eider productivity on the western Beaufort Sea coast is influenced by conditions encountered in May to early June during their spring migration through the Chukchi Sea (including Ledyard Bay). Common eider female body mass increased 20% during the 4-6 weeks prior to egg laying (Gorman and Milne 1971, Milne 1976, Korschgen 1977, Parker and Holm 1990). For spectacled eiders, average female body weight in late March in the Bering Sea was 1,550 ± 35 g (n=12), and slightly (but not significantly) more upon arrival at breeding sites (1,623 ± 46 g, n=11) (Lovvorn et al. 2003), indicating that spectacled eiders must maintain or enhance their physiological condition during spring staging.

Abundance and Trends

The most recent range wide estimate of the total number of spectacled eiders was 363,000 (333,526-392,532 95% CI), obtained by aerial surveys of the known wintering area in the Bering Sea in late winter 1996-1997 (Petersen et al. 1999).

Spectacled eider density varies across the North Slope (Figure 3.3). Aerial surveys targeting eiders have been conducted annually by the Service since 1992. Data from these surveys suggests the population between 1993 and 2006 was stable, with an average (n=14) annual growth rate of 0.997 (0.978-1.016 90% C.I.). The most recent (2002-2006) population index for North Slope breeding spectacled eiders is 6,458 (5,471-7,445 95% CI). This index was adjusted by a factor that accounts for the number of nests missed during aerial surveys (developed for the Y-K Delta) and used to calculate a North Slope breeding spectacled eider population estimate of 12,916 (10,942-14,890 95% CI) (Stehn et al. 2006).

For spectacled eiders breeding on the Arctic Coastal Plain, the 2009 unadjusted population index based on aerial surveys was 5,018 birds (3,343–6,692, 95% CI; Larned et al. 2010). The mean population growth rate (0.985) of North Slope spectacled eiders from 1993–2009 indicates a slight decline (n = 17; 0.971–0.999, 90% CI; Larned et al. 2010).

Recovery Criteria

The Spectacled Eider Recovery Plan (USFWS 1996) presents research and management priorities with the objective of recovery and delisting so that protection under the ESA is no longer required. Although cause of the spectacled eider population decline is not known, factors that affect adult survival may be the most influential on population growth rate. Under the Recovery Plan, the species will be considered recovered when each of the three recognized populations (Y-K Delta, North Slope of Alaska, and Arctic Russia):

1) is stable or increasing over 10 or more years and the minimum estimated population size is at least 6,000 breeding pairs, or 2) number at least 10,000 breeding pairs over 3 or more years, or 3) number at least 25,000 breeding pairs in one year. Spectacled eiders do not currently meet these recovery criteria.

Critical Habitat
Critical habitat units have been designated to protect molting areas and the only known wintering area. These units do not include the Action Area.

3.2 Steller's Eider

Physical Appearance
The Steller's eider is the smallest of the four eider species. From early winter until mid-summer males are in breeding plumage - black back, white shoulders and sides, chestnut breast, white head with black eye patches and a greenish tuft (Figure 3.5). During late summer and fall, males molt to dark brown with a white-bordered blue wing speculum; this plumage is replaced during the autumn molt when males re-acquire breeding plumage, which lasts through the next summer. Females are dark mottled brown with a blue wing speculum year round. Juveniles are dark mottled brown until the fall of their second year, when they acquire breeding plumage (Fredrickson 2001).

Figure 3.5 - Male and female Steller's eider in breeding plumage.

Status and Distribution
The Steller's eider is a circumpolar sea duck. Steller's eiders are divided into Atlantic and Pacific populations; the Pacific population is further divided into the Russia-breeding population along the Russian eastern arctic coastal plain, and the Alaska-breeding population.

On June 11, 1997, the Alaska-breeding population of Steller's eiders was listed as threatened based on a substantial decrease in this population's breeding range and the increased vulnerability of the remaining Alaska-breeding population to extirpation (USFWS 1997). Although population size estimates for the Alaska-breeding population were imprecise, it was clear Steller's eiders had essentially disappeared as a breeding species from the Y-K Delta, where they had historically occurred in significant numbers, and that their Arctic Coastal Plain (North Slope) breeding range was much reduced. On the North Slope they historically occurred east to the Canada border (Brooks 1915), but have not been observed on the eastern North Slope in recent decades (USFWS 2002). The Alaska-breeding population of Steller's eiders now nests primarily on the North Slope, particularly around Barrow and at very low densities from Wainwright to at least as far east as Prudhoe Bay (Figure 3.6). A few pairs may remain on the Y-K Delta; 9 nests have been found in the last 14 years (USFWS, unpublished data).

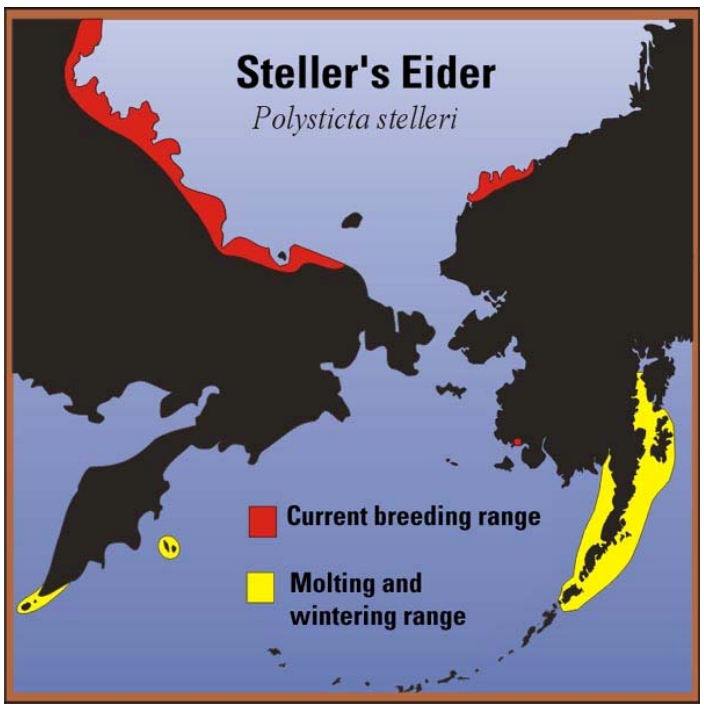


Figure 3.6 - Steller's eider distribution in the Bering, Beaufort and Chukchi seas (USFWS 2002).

Life History – North Slope (Breeding)

Steller's eiders arrive in pairs on Alaska's North Slope in early June, but are intermittent breeders; since 1991, Steller's eiders near Barrow apparently nested in 10 years but did not nest in 7 years (Rojek 2008). Individuals foregoing breeding is common in long-lived eider species and is typically related to inadequate body condition (Coulson 1984), but reasons for Steller's eiders non-breeding may be more complex. In the Barrow area, Steller's eider nesting is correlated with lemming numbers and other environmental cues; nest success could be enhanced in years of lemming abundance because nest predators are less likely to prey-switch to eider eggs and young, or because avian predators such as pomarine jaegers (*Stercorarius pomarinus*) and snowy owls (*Nyctea scandiaca*) that nest nearby (and consume abundant lemmings) may protect eider nests from mammalian predators such as arctic fox (Quakenbush and Suydam 1999, and summarized by Rojek 2006).

When they do breed, Alaska-breeding Steller's eiders nest on coastal tundra adjacent to small ponds or within drained lake basins, occasionally as far as 90 km inland. Nests are initiated in the first half of June (Quakenbush et al. 1995), and hatching occurs from July 7 to August 3 (Quakenbush et al. 1998). Nests located in the vicinity of Barrow were in wet tundra, in drained lake basins or low-center or low indistinct flat-centered polygon areas (Quakenbush et al. 1998). Average clutch sizes at Barrow varied from 5.3-6.3, with clutches of up to 8 reported (Quakenbush et al. 1998, Rojek 2005). Nest success (proportion of nests with at least one egg hatched) at Barrow averaged 17% from 1991-2002 (Service, unpublished data). As with spectacled eiders, nest and egg loss was attributed to predation by jaegers, common raven (*Corvus corax*), arctic fox, and possibly glaucous gulls (*Larus hyperboreus*) (Quakenbush et al. 1995, Obritschkewitsch et al. 2001).

Within a day or two after hatch, hens move their broods to adjacent ponds with emergent vegetation, particularly *Carex* spp. and *Arctophila fulva* (Quakenbush et al. 1998, Rojek 2006, 2007) Here they feed on insect larvae and other wetland invertebrates. Broods may move up to several kilometers from the nest prior to fledging (Quakenbush et al. 1998, Rojek 2006). Fledging occurs from 32-37 days post hatch (Obritschkewitsch et al. 2001, Rojek 2006).

Life History – North Slope (Non-breeding)
Departure from the breeding grounds differs between sexes and between breeding and non-breeding years. Male Steller's eiders typically leave the breeding grounds after females begin incubating, around the end of June or early July (Quakenbush et al. 1995, and Obritschkewitsch et al. 2001). Females whose nests fail may remain near Barrow later in summer; a single failed-breeding female equipped with a transmitter in 2000 remained near the breeding site until the end of July and stayed in the Beaufort Sea off Barrow until late August (Martin et al. *in prep*). Successfully-breeding females and fledged young depart the breeding grounds in early to mid-September. In a non-breeding year, satellite-transmittered males and females dispersed across the area between Wainwright and Admiralty Inlet in late June and early July, with most birds entering marine waters by the first week of July. They were tracked at coastal locations from Barrow to Cape Lisburne, and made extensive use of lagoons and bays on the north coast of Chukotka (Martin et al. *in prep*.).

After the breeding season, Steller's eiders move to marine waters where they undergo a complete flightless molt for about 3 weeks. The combined (Russia- and Alaska-breeding) Pacific population molts in numerous locations in southwest Alaska, with exceptional concentrations in four areas along the north side of the Alaska Peninsula: Izembek Lagoon, Nelson Lagoon, Port Heiden, and Seal Islands (Gill et al. 1981, Petersen 1981, Metzner 1993). After molt, many of the Pacific-wintering population of Steller's eiders disperse to winter in the eastern Aleutian Islands, the south side of the

Alaskan Peninsula, and as far east as Cook Inlet, although thousands may remain in lagoons used for molt unless or until freezing conditions force them to move (USFWS 2002).

Prior to spring migration, thousands of Steller's eiders stage in estuaries along the north side of the Alaska Peninsula, including some molting lagoons, and at the Kuskokwim Shoals near the mouth of the Kuskokwim River in late May (Larned 2007, Martin et al. *in prep*.). Like other eiders, Steller's eider may use spring leads for feeding and resting, but there is little information on habitat use during spring migration. It seems likely Steller's eiders are also using the Chukchi lead system similarly to king eiders (Steffen Oppel, University of Alaska-Fairbanks, unpublished data).

Alaska-breeding Steller's Eider Abundance and Trends

Stehn and Platte (2009) conducted a review of the distribution, abundance, and trend of the listed population of Steller's eiders on the ACP. Utilizing information from three aerial surveys, (the ACP, the North Slope eider survey (NSE) and the Barrow Triangle survey (ABR)), they assessed the population status and trend of the Steller's eider population nesting on tundra wetlands of northern Alaska. Data reported from these three surveys provide different estimates of average population size and trend. The 1989-2008 ACP survey (Mallek et al. 2007) estimated a total average population size of 866 birds with a declining growth rate of 0.778; the NSE are from 1992-2008 (Larned et al. 2009) averaged 162 birds with increasing growth rate of 1.059. The ABR survey from 1999-2007 (Obrishkewitsch et al. 2008) averaged 100 birds with a growth rate of 0.934. Average population size and trend can be biased by changes in observer, detection rates and survey timing. Survey timing was considered especially important for species with male departure early in incubation, or other marked shifts in habitat use, movements, or flocking behavior (ground breeding surveys near Barrow indicate the best time for aerial surveys of breeding Steller's is about 12-20 June, after arrival of most breeding individuals but before most males depart. Using a subset of data least confounded by changes in survey timing and observer, the appropriately-timed NSE survey observations from 1993-2008 averaged 173 indicated total Steller's eiders (88-258, 90% confidence interval) with an estimated growth rate of 1.011 (0.85 –1.193, 90% CI). The authors assumed a detection probability of 30% (based upon reasonable estimates with similar species and habitats), yielding a total average population of Steller's eiders breeding in the ACP of about 576 (292–859, 90% CI) individuals (Stehn and Platte 2009). Aerial surveys in 2009 detected so few birds that meaningful population abundance and trend estimates cannot be calculated from those data (Larned et al. 2010).

Recovery Criteria

The Steller's Eider Recovery Plan (USFWS 2002) presents research and management priorities, that are re-evaluated and adjusted every year, with the objective of recovery and delisting so that protection under the ESA is no longer required. When the Alaska-breeding population was listed as threatened, factors causing the decline were unknown, but possible causes identified were increased predation, over hunting, ingestion of spent lead shot in wetlands, and habitat loss from development. Since listing, other potential threats have been identified, including exposure to other contaminants, scientific research, and climate change but causes of decline and obstacles to recovery remain poorly understood.

Criteria to be used in determining when species are recovered are often based on historical abundance and distribution, or on the number needed to ensure the risk of extinction is tolerably low (with extinction risk estimated by population modeling). For Steller's eiders, information on historical abundance is lacking, and life history parameters needed for accurate population modeling are inadequately understood. Therefore, the Recovery Plan for Steller's eiders establishes interim recovery criteria based on extinction risk, with the assumption that numeric population goals will be developed as life history parameters become better understood. Under the Recovery Plan, the Alaska-breeding population would be considered for reclassification to endangered if the population has ≥ 20% probability of extinction in the next 100 years for 3 consecutive years, or the population has ≥ 20% probability of extinction in the next 100 years and is decreasing in abundance. The Alaska-breeding population would be considered for delisting from threatened status if it has ≤ 1% probability of extinction in the next 100 years, and each of the northern and western subpopulations are stable or increasing and have ≤ 10% probability of extinction in 100 years.

Steller's Eider Critical Habitat

In 2001, the Service designated 2,830 mi^2 (7,330 km^2) of critical habitat for the Alaska-breeding population of Steller's eiders at breeding areas on the Y-K Delta, a molting and spring-staging area in the Kuskokwim Shoals, and molting areas in marine waters at the Seal Islands, Nelson Lagoon, and Izembek Lagoon (USFWS 2001). None of these critical habitat units are within the Action Area so they are not discussed further.

4. ENVIRONMENTAL BASELINE

The environmental baseline provides an analysis of the effects of past and ongoing human and natural factors leading to the current status of the species, their habitat, and ecosystem in the action area.

Spectacled and Steller's eiders are present in the project action areas from late May through September. Both species have undergone significant, unexplained declines in their Alaska-breeding populations. Factors that may have contributed to the current status of spectacled and Steller's eiders are discussed below and include, but are not limited to, toxic contamination of habitat, increase in predation, over harvest, and habitat loss through development and disturbance. Recovery efforts for both species are underway in portions of the action area.

Toxic Contamination of Habitat

The deposit of lead shot in tundra or nearshore habitats used for foraging is a threat for spectacled and Steller's eiders. Lead poisoning of spectacled eiders has been documented on the Yukon-Kuskokwim Delta (Franson et al. 1995, Grand et al. 1998) and Steller's eiders on the Arctic Coastal Plain (Trust et al. 1997; USFWS unpublished data).

Figure 4.1 indicates female Steller's eiders nesting at Barrow in 1999 had blood lead concentrations that reflected exposure to lead (>0.2 ppm lead), and six of the seven tested had blood lead concentrations that indicated poisoning (>0.6 ppm lead). Additional lead isotope tests confirmed the lead in the Steller's eider blood was of lead shot origin, not naturally occurring forms found in sediments where Steller's eiders occur (Angela Matz, USFWS, unpublished data).

Use of lead shot for hunting waterfowl is prohibited statewide, and for hunting all birds on the North Slope. Hunter outreach programs are being undertaken to reduce any lingering illicit use of lead shot that may be occurring on the North Slope.

Water birds in arctic regions are also exposed to global contamination, including radiation, industrial, and agricultural chemicals that can be transported by atmospheric and marine transport. Twenty male spectacled eiders wintering near St. Lawrence Island examined for the presence and effects of contaminants apparently were in good condition, but had high concentrations of metals and subtle biochemical changes that may have long term effects (Trust et al. 2000).

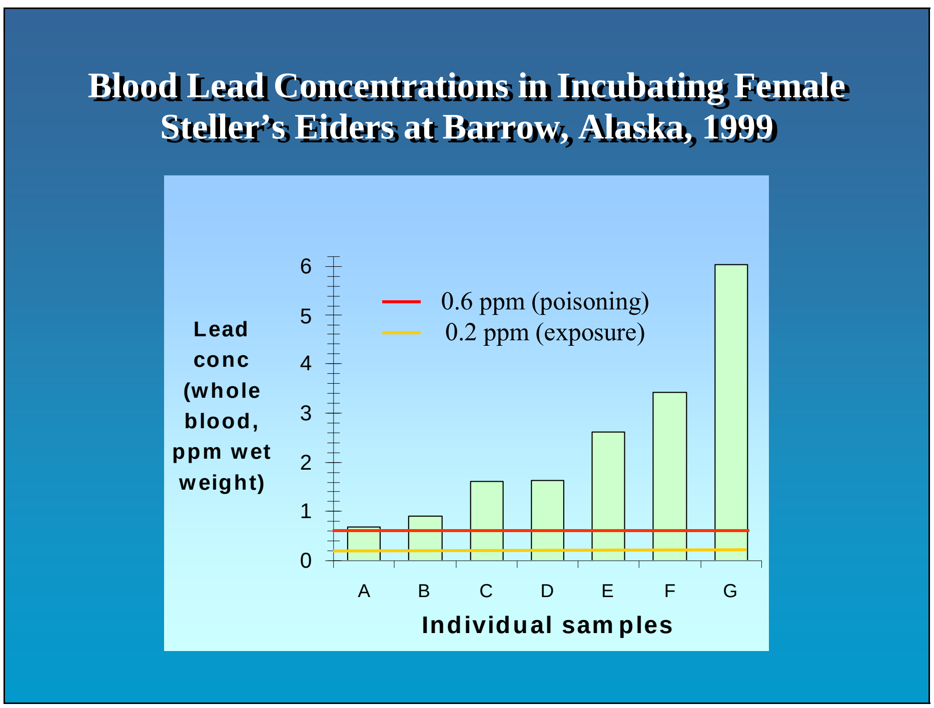


Figure 4.1 - Blood lead concentrations in incubating female Steller's eiders at Barrow, 1999 (USFWS data)

Increase in Predator Populations

It has been speculated that anthropogenic influences on predator populations or predation rates may have affected eider populations, but this has not been substantiated. Steller's eider studies at Barrow suggest that high predation rates explain poor breeding success

(Quakenbush et al. 1995, Obritschkewitsch et al. 2001). Researchers have proposed that reduced fox trapping, anthropogenic food sources in villages and oil fields, and nesting sites on human-built structures have increased fox, gull, and raven numbers (R. Suydam and D. Troy pers. comm., Day 1998), but the connection between these factors and increased predation rates has not been proven.

Over Harvest
Hunting for spectacled and Steller's eiders was closed in 1991 by Alaska State regulations and Service policy. Outreach efforts have been conducted by the North Slope Borough, BLM, and Service to encourage compliance. However, harvest data collected from the spring/summer subsistence hunts suggests that both Steller's and spectacled eiders are being taken during this hunt on the North Slope (USFWS data). Measures have been recently implemented to avoid and minimize the lethal take of listed eiders on the North Slope during spring/summer subsistence hunts.

Habitat Loss through Development and Disturbance
With the exception of contamination by lead shot, destruction or modification of nesting habitat is not thought to have played a major role in the decline of spectacled or Steller's eiders. Until recently eider breeding habitat on the ACP was largely unaltered by humans, but now limited portions of each species' breeding habitat has been altered by fill of wetlands, the presence of infrastructure that presents collision risk, and other types of human activity that may disturb birds or increase populations of nest predators.

The population of communities such as Barrow has been increasing, and BLM (2007) expects growth to continue at approximately 2% per annum until at least the middle of this century. Assuming community infrastructure and footprint grow at roughly the same pace as population, BLM (2007) estimates that community footprint could cover 3,600 acres by the 2040s. Oil and gas development has steadily moved westward across the ACP towards NPR-A since the initial discovery and development of oil on the North Slope. Given industries interest in NPR-A, as expressed in lease sales, seismic surveys, and drilling of exploratory wells, the westward expansion of industrial development is likely to continue. Scientific, field-based research is also increasing on the ACP as interest in climate change and impacts to high latitude areas continues.

Climate Change
High latitude regions, such as Alaska's North Slope, are thought to be especially sensitive to the effects of climate change (Quinlan et al. 2005, Schindler and Smol 2006, and Smol et al. 2005). While climate change will likely affect individual organisms and communities it is difficult to predict with any specificity how these effects will manifest. Biological, climatological, and hydrologic components of the ecosystem are interlinked and operate on multiple spatial, temporal, and organizational scales with feedback between the components (Hinzman et al. 2005).

There are a wide variety of changes occurring in the arctic worldwide, including Alaska's North Slope. Arctic landscapes are dominated by lakes and ponds (Quinlan et al. 2005), such as those used by listed eiders for feeding and brood rearing. In many areas these water bodies are drying out during the summer as a result of thawing permafrost (Smith et al. 2005 and Oechel et al. 1995), and increased evaporation and evapotranspiration as they are ice-free for longer periods (Schindler and Smol 2006, and Smol and Douglas 2007). Productivity of lakes and ponds appears to be increasing as a result of nutrient inputs from thawing soil and an increase in degree days (Quinlan et al. 2005, Smol et al. 2005, Hinzman et al. 2005, and Chapin et al. 1995). Changes in water chemistry and temperature are resulting in changes in the algal and invertebrate communities, which form the basis of the food web in these areas (Smol et al. 2005, Quinlan et al. 2005).

With the reduction in summer sea ice, the frequency and magnitude of coastal storm surges has increased. These often result in breaching of lakes and low lying coastal wetland areas killing salt intolerant plants and altering soil and water chemistry, and hence, the fauna and flora of the area (USGS 2006). Historically sea ice has served to protect shorelines from erosion; however, this protection has decreased as sea ice has declined. Coupled with softer, partially thawed permafrost, the lack of sea ice has significantly increased coastal erosion rates (USGS 2006), potentially reducing available coastal tundra habitat.

Changes in precipitation patterns, air and soil temperature, and water chemistry are also affecting tundra vegetation communities (Hinzman et al. 2005, Prowse et al. 2006, Chapin et al. 1995), and boreal species are expanding their range into tundra areas (Callaghan et al. 2004). Changes in the distribution of predators, parasites, and disease causing agents resulting from climate change may have significant effects on listed species and other arctic fauna and flora. Climate change may also result in mismatched timing of migration and the development of food in Arctic ponds (Callaghan et al. 2004), and changes in the population cycles of small mammals such as lemmings to which many other species, including nesting Steller's eiders (Quakenbush and Suydam 1999), are linked (Callaghan et al. 2004).

While the impacts of climate change on listed species in both the action area and marine environment that comprises the rest of their range are unclear, species with small populations are vulnerable to environmental change (Crick 2004). Some species will increase in abundance and range with climate change, while others will suffer from reduced population size and range. The ultimate effects of climate change on listed eiders are undetermined at present.

5. EFFECTS OF THE ACTION ON LISTED SPECIES

This section of the BO provides an analysis of effects of the action on listed species and critical habitat. Both direct effects, i.e., those immediately attributable to the action; and indirect effects, i.e., those caused by the action but which will occur later in time, are considered. Finally, interrelated and interdependent effects of the action are discussed.

5.1 Direct Effects

The proposed project may adversely affect listed eiders through disturbance. Aircraft landings and on-the-ground activities may flush females from their nests. This exposes eggs or young ducklings to inclement weather and predators. Hens may damage eggs as they are flushed from a nest (Major 1989); and may abandon nests entirely, particularly if disturbance occurs early in the incubation period (Livezy 1980, Götmark and Ählund 1984).

Individual tolerance and behavioral response of Steller's and spectacled eiders to disturbance likely varies. Steller's eiders have been observed nesting and raising broods close to the Barrow airport, and spectacled eiders are known to nest close to the Deadhorse airport (USFWS data). Studies of spectacled eider responses to aircraft and construction activities at the Alpine oilfield suggests broods can be raised successfully close to areas with significant levels of disturbance (Johnson et al. 2006). Disturbance that is regular and ongoing allows sensitive individuals to move away and less sensitive individuals to become habituated. Activities assessed in this BO will occur in remote areas of NPR-A where birds are not subject to regular disturbance. Hence, eiders nesting in these areas likely have no opportunity to become habituated.

In a review of the effects of field observers on nesting success of common eiders, Götmark (1992) concluded 76% of papers showing decreased nest success as a result of disturbance attributed the reduction to predation and 34% to desertion. Data from the Y-K Delta indicates that nest disturbance from human activity results in decreases in spectacled eider nest survival rate of 4% (Bowman and Stehn 2003), and 14% (Grand and Flint 1997). However, Mickleson (1975) suggested very low rates of desertion, 0.8% naturally with an additional 0.7% as a result of human disturbance, in his studies of cackling geese and spectacled eiders on the Y-K Delta. A 6% desertion rate for ducks nesting on a refuge in Wisconsin was documented by Livezey (1980), and Johnson (1984) documented several nests abandoned by female common eiders after human disturbance on Thetis Island, northern Alaska.

While both avian and mammalian predators have been documented depredating nests after a hen has been flushed by humans, Götmark (1992) concluded that avian predators were most likely to have an effect as a result of disturbance. Grand and Flint (1997) suggested avian predators, particularly gulls, were more prevalent than mammalian predators on the Y-K Delta. Similar results were reported from studies in the area by Mickelson (1975) who attributed 85.9% of nest predation to avian predators, while Vacca and Handel (1988) attributed 78% of predation to avian predators. Given the similar fauna, vegetation, and terrain it is likely that avian predators would also be more significant than mammalian predators if nests are disturbed on the North Slope.

The effects of human disturbance may be reduced if predators are also disturbed and move away from the area. While corvids appeared to negatively respond to humans and move away when disturbed, Götmark and Ählund (1984) noted a weak attraction to humans by gulls. In contrast Strang (1980), observed an attraction to humans from parasitic jaegers but not by gulls. It remains unclear how human presence will affect predator behavior in NPR-A.

Summary
The landing and subsequent driving of birds by 3 float planes or people working in the onshore area may disturb nesting eiders. This disturbance may result in hens flushing from nests, possibly damaging one or more eggs. While the nest is unattended eggs and young ducklings are vulnerable to predators, and if left unattended for long enough, eggs or ducklings may die from exposure.

5.2 Indirect Effects

Indirect effects of the action are defined as "those effects that are caused by or will result from the proposed action and are later in time, but are still reasonably certain to occur" (50 CFR §402.02). While the studies proposed for 2010 may lead to additional research in the future, future studies cannot be said to be reasonably expected to occur. Therefore, no indirect effects to listed eiders are anticipated to result from the proposed activities.

5.3 Interrelated and Interdependent Actions

Interdependent actions are defined as "actions having no independent utility apart for the proposed action," while interrelated actions are defined as "actions that are part of a larger action and depend upon the larger action for their justification" (50 CFR §402.02). The Service has not identified any interdependent or interrelated actions that may result from the proposed activities that could result in additional effects to listed eiders.

6. CUMULATIVE EFFECTS

Under the Act, cumulative effects are the effects of future State, tribal, local, or private actions that are reasonably certain to occur in the action area considered in this BO. Future Federal actions that are unrelated to the proposed action are not considered because they require separate consultation under the Act.

Pre-development activities such as right-of-way staking, ice-road water source evaluations, and archeological surveys are increasing as oil and gas exploration continues in NPR-A. Concurrent increases in compliance inspections, habitat surveys, and resource monitoring activities are anticipated. Research on vegetation, soils, hydrology, and fauna in NPR-A is likely to increase as global climate change concerns focuses interest in high latitude areas. There are a number of study plots in the area providing baseline data, further increasing interest in use of the area by scientists. Because these actions will either be conducted by federal agencies, or require authorization by BLM, they are not considered cumulative impacts for the purposes of this BO.

Future oil development and its associated infrastructure (such as pipelines, processing facilities, and airstrips) was previously described and evaluated in the BOs for the Northeast and Northwest NPR-A IAP/EISs. If development exceeds that predicted in these plans, additional consultation would be required.

Other State, local government, or private activities that may take place in the action area include infrastructure development (such as roads, power lines, or telecommunication towers), increased tourism, and community growth. Because the majority of the action area is classified as wetlands, a section 404 permit from the U.S. Army Corps of Engineers would be necessary for proposed development and consultation under the Act would be required.

In summary, we anticipate potential increase in development, associated surveying and monitoring activities, scientific research, and community growth in coming decades. However, all significant projects have either been considered in previous consultations, or will require future consultation under the Act. Hence, no cumulative effects have been identified.

7. CONCLUSIONS

After reviewing the current status of spectacled and Alaska-breeding Steller's eiders, the environmental baseline, effects of the proposed activities, and cumulative effects, it is the Service's biological opinion that the proposed activities are not likely to jeopardize the continued existence of either species.

In evaluating the impacts of the proposed project to Steller's and spectacled eiders, the Service concludes that direct adverse impacts could result through disturbance of nesting females from proposed activities.

Using methods and logic explained in the Incidental Take Statement below, we estimate up to 4 spectacled eider eggs or ducklings may be incidentally taken as a result of actions described in this BO. No incidental take of Steller's eiders is anticipated.

While still take, it is important to note that the loss of eggs is of much lower significance for survival and recovery of spectacled eiders than the death of an adult bird. For example, spectacled eider nest success recorded on the Y-K Delta ranged from 18-73% (Grand and Flint 1997). From the nests that survived to hatch, spectacled eider duckling survival to 30-days on the Y-K Delta ranged from 25-47% (Flint et al. 2000). Over-winter survival of one-year old spectacled eiders was estimated at 25% (Flint pers. comm.), and annual survival of 2-year old birds (which may enter the breeding population) 80% (Grand et al. 1998). Using these data we estimate for every 100 spectacled eider eggs laid on the Y-K Delta, at most 1–7 may survive to enter the breeding population. Similarly, we expect that only a small proportion of spectacled eider eggs or ducklings on the North Slope would eventually survive to maturity.

The population of North Slope-breeding spectacled eiders is estimated at 12,916 (10,942-14,890 95% CI; Stehn et al. 2006); hence, the estimated loss of 4 eggs is not expected to have significant population-level effects. The Service believes this level of incidental take will not significantly affect the likelihood of survival and recovery of spectacled eiders.

8. INCIDENTAL TAKE STATEMENT

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

The measures described below are non-discretionary, and must be undertaken by the Migratory Bird Management Office (MBM Office) of the Service 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 MBM Office has a continuing duty to regulate activities covered by this incidental take statement. If the MBM Office fails to assume and implement the terms and conditions, through enforceable terms that are added to the permit or grant document, the protective coverage of section 7(o)(2) may lapse.

As described in *Section 5 - Effects of the Actio*n, the activities described and assessed in this BO may adversely affect Steller's and spectacled eiders through disturbance of nesting eiders by the landing and subsequent driving of birds by 3 float planes or people working in the onshore areas.

The estimated average density of listed eiders across the North Slope in 2009 was 0.165 spectacled eiders/km^2, and hence we assume 0.083 nests/ km^2; and 0.002 Steller's eiders/km^2 or 0.001 nests/ km^2 (Larned et al. 2010). These average densities were used to estimate incidental take, as described below.

The number of hens that may be flushed during greater white-fronted goose banding and avian influenza surveillance activities was calculated multiplying the area disturbed (2.59 km^2) at each site by the number of proposed sites (4), and the average nest density for each species, resulting in an estimate of 1 spectacled eider and no Steller's eider flush events as follows:

4 sites x 2.59 km^2 = 10.36 km^2 affected

0.083 spectacled eider nests/km^2 x 10.36 km^2 = 0.86 spectacled eider flush events

0.001 Steller's eider nests/km^2 x 10.36 km^2 = 0.01 Steller's eider flush events

During this study float planes will land on lakes, and slowly herd geese towards an onshore banding station. It is estimated that each of the four banding drives may disturb listed eiders over an area of 2.59 km^2, although much of this area will be lake surface, and not eider nesting habitat. We have no data to determine how listed eiders may respond to this type of disturbance. Therefore, we have been as conservative as possible, and assumed all nests in the disturbed area will fail.

Conclusion
Using the data, assumptions, and methodology explained above, we estimate the proposed activities may result in the loss of 1 spectacled eider nest and less than 1 Steller's eider nest.

Average clutch size for spectacled eiders in northern Alaska is 3.9 (Petersen et. al. 2000, Bart and Earnst 2005, Johnson et al. 2008). Using this figure, we estimate that activities described in this BO would result in the loss of production of 1 spectacled eider nests (0.86 flush events), resulting in the loss of 4 spectacled eider eggs or ducklings (1 x 3.9 = 3.9).

Similarly, our estimates suggest that given the very low numbers of Steller's eiders in the action area less than 1 nest would be impacted (0.01 flush events) and no loss of production is likely to result from the proposed activities.

9. REASONABLE AND PRUDENT MEASURES

These reasonable and prudent measures (RPMs) and their implementing terms and conditions aim to minimize the incidental take anticipated from activities described in this BO. As described in *Section 8 – Incidental Take Statement*, activities conducted by MBM Office are anticipated to lead to incidental take of spectacled eiders through disturbance of nesting females.

RPM A – To reduce the probability of depredation, any observed unattended eider nests should be covered with down, and field crews should leave the nest area as a soon as practicable.

RPM B – To increase our understanding of the impact of disturbance on nesting Steller's and spectacled eiders the location of any listed eider nests and observed responses of these birds should be reported.

10. TERMS AND CONDITIONS

To be exempt from the prohibitions of Section 9 of the Act, MBM Office must comply with the following terms and conditions, which implement the RPMs described above. These terms and conditions are non-discretionary.

RPM A – To reduce the probability of depredation, any observed unattended eider nests should be covered with down, and field crews should leave the nest area as a soon as practicable.

Covering unattended eggs with down after a hen flushes from a nest significantly reduces the rate of depredation (Vacca and Handel 1988, Götmark and Ählund 1984). Therefore, if unattended Steller's or spectacled eider nests are encountered field crews should cover eggs while following all pertinent health and safety guidelines. Crews should also leave the nest area as quickly as possible to allow the hen to return.

RPM B – To increase our understanding of the impact of disturbance on nesting Steller's and spectacled eiders the location of any listed eider nests and observed responses of these birds should be reported.

Any observations of Steller's or spectacled eiders, or their nests, along with the location, date of observation, and a brief description of any observed behavior (e.g., a hen flushed when the helicopter landed but was observed returning to her nest after 5 minutes), should be provided to the Endangered Species Branch of the Fairbanks Fish and Wildlife Field Office by September 1, 2010.

11. CONSERVATION RECCOMENDATIONS

Section 7(a)(1) of the Act directs federal agencies to utilize their authorities to further the purposes of the Act by carrying out conservation programs for the benefit of endangered and threatened species. Conservation recommendations are discretionary agency activities to minimize or avoid adverse effects of a proposed action on listed species or critical habitat, to help implement recovery plans, or to develop information. We have identified no conservation recommendations for this project.

12. REINITIATION NOTICE

This concludes formal consultation for Region 7 Migratory Bird Management's proposed project Greater White-fronted Goose and Avian Influenza Surveillance on the North Slope of Alaska 2010. As provided in 50 CFR 402.16, re-initiation of formal consultation is required where discretionary Federal agency involvement or control over the action has been retained (or is authorized by law) and if:

1) The amount or extent of incidental take is exceeded;
2) New information reveals effects of the action agency that may affect listed species or critical habitat in a manner or to an extent not considered in this opinion;
3) The agency action is subsequently modified in a manner that causes an effect to listed species or critical habitat not considered in this opinion; or
4) A new species is listed or critical habitat is designated that may be affected by the action.

Thank you for your cooperation in the development of this biological opinion. An administrative record of this consultation is on file at the Fairbanks Fish and Wildlife Field Office, 101 12th Ave., Room 110, Fairbanks, Alaska 99701. If you have any comments or concerns regarding this biological opinion, please have your staff contact Denise Walther, Fish and Wildlife Biologist, Fairbanks Fish and Wildlife Field Office at (907) 456-0277.

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APPENDIX 1

POLAR BEAR INTERACTION GUIDELINES

These Polar Bear Interaction Guidelines (Guidelines) were developed to ensure that activities are conducted in a manner that avoids conflicts between polar bears and humans. Polar bears are protected under the Marine Mammal Protection Act (MMPA), and were listed as a threatened species under the Endangered Species Act (ESA) in 2008. These acts both prohibit the "take" of polar bears without authorization. Take includes harassment, as well as physical injury and killing of individuals.

In addition to sea ice, polar bears use marine waters and lands in northern Alaska for resting, feeding, denning, and seasonal movements. They are most likely to be encountered within 25 miles of the coastline, especially along barrier islands during July-October. Polar bears may also be encountered farther inland, especially females during the denning period (October-April). Polar bears may react differently to noise and human presence. The general methods for minimizing bear-human conflicts are to: 1) avoid detection and close encounters; 2) minimize attractants; and 3) recognize and respond appropriately to polar bear behaviors. These Guidelines provide information for avoiding conflicts with polar bears during air, land, or water-based activities.

Unusual sightings or questions/concerns can be referred to: Susanne Miller or Craig Perham, Marine Mammals Management Office (MMM Office), 1-800-362-5148; or to Kate Martin (907) 456-0215 of the Fairbanks Fish & Wildlife Field Office (FFWFO).

<u>When operating aircraft:</u>

- If a polar bear(s) is encountered, divert flight path to a minimum of 2,000 feet above ground level or ½ mile horizontal distance away from observed bear(s) whenever possible.

<u>When traveling on land or water:</u>

- Avoid surprising a bear. Be vigilant—especially on barrier islands, in river drainages, along bluff habitat, near whale or other marine mammal carcasses, or in the vicinity of fresh tracks.

- Between October and April special care is needed to avoid disturbance of denning bears. If activities are to take place in that time period the MMM Office should be contacted to determine if any additional mitigation is required. In general, activities are not permitted within one mile of known den sites.

- Avoid carrying bear attractants (such as strongly scented snacks, fish, meat, or dog food) while away from camp; if you must carry attractants away from camp, store foods in air-tight containers or bags to minimize odor transmission until you return them to "bear-resistant" containers.*

- If a polar bear(s) is encountered, remain calm and avoid making sudden movements. Stay downwind if possible to avoid allowing the bear to smell you. Do not approach polar bears. Allow bears to continue what they were doing before you encountered them. Slowly leave the vicinity if you see signs that you've been detected. Be aware that safe viewing distances will vary with each bear and individual situation. Remember that the closer you are to the animal, the more likely you are to disturb it.

- If a bear detects you, observe its behavior and react appropriately. Polar bears that stop what they are doing to turn their head or sniff the air in your direction have likely become aware of your presence. These animals may exhibit various behaviors:

  - *Curious* polar bears typically move slowly, stopping frequently to sniff the air, moving their heads around to catch a scent, or holding their heads high with ears forward. They may also stand up.

  - *A threatened or agitated* polar bear may huff, snap its jaws together, stare at you (or the object of threat) and lower its head to below shoulder level, pressing its ears back and swaying from side to side. These are signals for you to begin immediate withdrawal by backing away from the bear and avoiding eye contact. If this behavior is ignored, the polar bear may charge. Threatened animals may also retreat.

  - In rare instances you may encounter an *aggressive bear*. It may sneak or crawl up on an object it considers prey. It may also approach in a straight line at constant speed without exhibiting curious or threatened behavior. This behavior suggests the bear is about to attack. Bears may approach in such a manner and charge a short distance (3-6 ft). Standing still, grouping together, shouting, and waving your hands will likely halt the bear's approach.

- If a polar bear approaches and you are in the bear's path—or between a mother and her cubs—get out of the way (without running). If the animal continues to approach, stand your ground. Gather people together in a group and/or hold a jacket over your head to look bigger. Shout or make noise to discourage the approach.

- If a single polar bear attacks, defend yourself by hitting or kicking. If the attack is by a female defending her cubs, remove yourself as a threat to the cubs by attempting to leave the area.

When camping:

- Avoid camping or lingering in bear high-use areas such as river drainages, coastal bluffs and barrier islands.

- Store food and other attractants in "bear-resistant" containers*. Consider the use of an electric fence as additional protection. Do not allow the bear to receive food as a reward in your camp. A food-rewarded bear is likely to become a problem bear for you or someone else in the future.

- Maintain a clean camp. Plan carefully to: minimize excess food; fly unnecessary attractants out on a regular basis (i.e. garbage, animal carcasses, excess anti-freeze or petroleum products); locate latrines at least ¼ mile from camp; and wash kitchen equipment after every use.

- If a polar bear approaches you in camp, defend your space by gathering people into a large group, making noise and waving jackets or tarps. Continue to discourage the bear until it moves off. Have people watch the surrounding area in case it returns later, keeping in mind that polar bears are known to be more active at night. Additional measures to protect your camp, such as electric fences or motion sensors can be used.

Harassment of polar bears is not permissible, unless such taking (as defined under the MMPA) is imminently necessary in defense of life, and such taking is reported to FWS within 48 hours.

*Containers must be approved and certified by the Interagency Grizzly Bear Committee as "bear-resistant." Information about certified containers can be found at http://www.igbconline.org/html/container.html.