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REGIONAL DIRECTOR, ALASKA OCS
Minerals Management Service
ANCHORAGE, ALASKA

Memorandum

To: Regional Director - Minerals Management Service

From: *Anthony* Regional Director - Region 7 *Ly Edwards*

Subject: Section 7 Consultation for Proposed Beaufort Sea Natural Gas and Oil
Lease Sale 186 - Final Biological Opinion

This memorandum transmits the U.S. Fish and Wildlife Service's final no jeopardy biological opinion based on our review of the Minerals Management Service's proposed Natural Gas and Oil Lease Sale 186 and associated exploration activities in the Beaufort Sea Planning Area in accordance with Section 7 of the Endangered Species Act (Act) of 1973, as amended (16 U.S.C. 1531 et seq.).

Over the last several weeks our staff worked closely together in reviewing and revising the document. We appreciated the open, and constructive dialogue that led to the finalization of the biological opinion. We look forward to working collaboratively with the Minerals Management Service staff in implementing the terms and conditions of the biological opinion. If your staff have any questions regarding the final biological opinion, please have them contact Steve Lewis, Project Leader, Fairbanks Fish and Wildlife Field Office, at (907) 456-0272, or Jonathan Priday, Endangered Species Biologist, FFWFO, at (907) 456-0499.

Attachment

**Biological Opinion
for Minerals Management Service's
Proposed Beaufort Sea Natural Gas and Oil Lease Sale 186**

Introduction

This document transmits the U.S. Fish and Wildlife Service's (Service) final biological opinion based on our review of the Minerals Management Service's (MMS) proposed Natural Gas and Oil Lease Sale 186 and associated exploration activities in the Beaufort Sea Planning Area in accordance with Section 7 of the Endangered Species Act (Act) of 1973, as amended (16 U.S.C. 1531 et seq.). The MMS's May 9, 2002, request for formal consultation was received on May 29, 2002. The MMS requested programmatic Section 7 consultation for proposed Beaufort Sea lease sales from 2003 through 2007 identified as Lease Sales 186, 195, and 202. The May 2002 Draft Alaska Outer Continental Shelf (OCS) Environmental Impact Statement (EIS) states that it is the sole National Environmental Policy Act (NEPA) analysis for Lease Sale 186 and that MMS will prepare an Environmental Assessment (EA) or supplemental EIS for Sales 195 and 202. Based upon the information contained in any future EA or supplemental EIS, the MMS will reinstate programmatic consultation on Lease Sales 195 and/or 202 at later dates if new information comes to light that would trigger the need for reinstatement.

The MMS requested that the following biological opinion supersede previous consultations on all prior and existing lease sale activity in the Beaufort Sea. The Service and MMS previously consulted on OCS Lease Sales 124, 144, and 170, all of which overlap with portions of the area covered in Lease Sale 186. Thus far, leases on all or parts of 60 blocks have been sold in previous actions resulting in one exploration project, McCovey, and two development/production projects, Liberty and the Northstar project. Consultations for the McCovey, Liberty, and Northstar projects have been completed. However, since the McCovey exploration project falls within the current proposed action, the final biological opinion for Lease Sale 186 will supersede the prior consultations covering McCovey. This biological opinion does not affect the consultations completed on the Northstar and Liberty projects.

For actions such as OCS oil and gas lease sales that are completed in incremental steps, the Service issues biological opinions on each step being considered. The following "incremental step" consultation is appropriate for long-term, multi-staged activities such as Lease Sale 186, for which agency actions occur in discrete steps. Although this is an "incremental step" consultation on leasing and exploration, information was also provided by MMS on potential development and production scenarios so that the Service could evaluate the likelihood of the entire action proceeding without violating Section 7(a)(2) of the Act.

In the first step of an incremental consultation, the Service must evaluate not only the proposed action, but also the potential entire action in order to determine the likelihood of the entire action violating Section 7(a)(2) of the Act. In this case, leasing and exploration are the proposed actions. Subsequent actions such as development and production are actions that

may occur at a later date and will require separate consultations. Based on the information provided on the proposed and potential activities, and the information currently available on listed and proposed species and designated and proposed critical habitat, the Service has determined that it is unlikely that the entire action, including development and production, will violate Section 7(a)(2) of the Act.

This final biological opinion is based on information provided in the May 2002 Draft Alaska OCS Environmental Impact Statement and other sources of supplied information to evaluate the effects of the proposed leasing and exploration actions. The following document represents the Service's biological opinion on the effects of that action on the threatened spectacled eider (*Somateria fischeri*) and Steller's eider (*Polysticta stelleri*), in accordance with Section 7 of the Act.

A chronology of the consultation actions regarding Lease Sale 186 is provided in Attachment 1. A complete administrative record of this consultation is on file at the Fairbanks Fish and Wildlife Field Office, 101 12th Ave., Box 19, Fairbanks, Alaska 99701.

Description of the Proposed Action

The activities considered in this consultation are oil and gas lease sales and subsequent exploratory drilling, testing, and surveying. Separate consultations for development and production activities will be conducted if oil is discovered and development plans are proposed. Lease Sale 186 is tentatively scheduled for September 2003. If held, Lease Sale 186 would be the eighth Federal offshore sale in the Beaufort Sea Planning Area. The proposal would offer for lease 1,877 blocks encompassing about 3.9 million hectares (9.7 million acres). The blocks that comprise the proposed action are approximately 3 to 25 nautical miles offshore in water depths that range from approximately <1 to 1,500 meters (2 to 4,900 feet).

Six exploration and 6 delineation wells are proposed to be drilled during the period 2004 through 2010. The project description indicates that a maximum of two drilling rigs would be operable in any one exploratory year, assuming one exploration rig per platform. According to MMS's estimates within the Lease Sale 186 EIS, it is likely that one exploration well will be drilled per year for 6 consecutive years starting in 2004.

Based on geologic studies, the MMS indicates that each exploratory or delineation well would require 425 short tons of drilling muds (dry weight) and produce approximately 525 short tons of dry rock cuttings. The MMS estimates 935-1,040 short tons (dry weight) of drilling muds and 5,775-6,300 short tons (dry weight) of bore cuttings would need to be disposed for the exploration and delineation activities for Lease Sale 186.

If the first commercial discovery is made in 2005, 2 years after the sale date in 2003, production from Lease Sale 186 would begin by 2010. Between 2009 and 2014, three

production facilities are likely to be brought online. The MMS estimates ~70 percent of production facilities would be located between the Canning River on the east and Colville River on the west in water depths less than 10 meters (Near Zone), ~30 percent would be located between Barter Island in the east to Cape Halkett in the west in water depths between 10 and 30 meters (Midrange Zone), and 0 percent would be located in the remainder of the program area extending from Barrow on the west to the Canadian boarder on the east (Far Zone). Spectacled eiders, especially females and broods, utilize the nearshore area of all three of these zones, especially areas offshore from the Colville Delta, Harrison Bay and Smith Bay (TERA 2002, review). Aerial surveys in the central Beaufort area done in 1999 and 2000 estimated that 166-371 spectacled eiders could have utilized the area that includes the Near and western Mid Zones (Stehn and Platte 2000). Steller's eiders are rarely found in the Far Zone and even less common farther east into the Mid- and Near Zones. Drilling production and injection wells are projected to begin in 2009 and conclude in 2017, with a total of 102 wells drilled. Oil production from Lease Sale 186 would end by 2033. Offshore pipeline construction is slated to begin in 2009 and finish in 2015, with 40 miles of new offshore pipeline installed. The offshore pipeline would likely connect to existing onshore pipelines.

Ice roads are assumed to be the principal transportation mode for routine supplies and materials to be transported to ice islands and/or nearshore gravel islands. For drilling platforms farther offshore in the broken-ice zone, material and supplies would be transported by support/supply boats (with icebreaking capacity, if necessary) during the open-water season and by helicopter at other times. For both types of drilling structures, most personnel would be transported by helicopters. The number of helicopter trips flown in support of exploration- and delineation-well drilling is assumed to range from about 90-270 each year, depending on the number of wells (1-3) that are drilled. For each drilling operation, there would be 1 flight per day of drilling. The time required to drill and test a well is about 90 days.

In the formulation of this biological opinion, the Service considered activities that would be interrelated and interdependent to the proposed action as well as accidental events that may occur as a result of the proposed action. Interrelated actions are those actions that are part of a larger action and depend on the larger action for their jurisdiction. Interdependent actions are those actions that have no independent utility apart from the action being considered in the biological opinion. Interrelated and interdependent activities that may occur in conjunction with the proposed action include construction of onshore support facilities, construction of onshore and offshore pipelines, and accidental oil spills originating from platforms, pipelines, and supply vessels.

STATUS OF THE LISTED SPECIES

Spectacled eider

The spectacled eider was listed as a threatened species under the Act in May 1993. Currently, primary nesting grounds are the Yukon-Kuskokwim Delta, the North Slope (Cape Simpson to the Sagavanirktok River) of Alaska, and in the Chaun Gulf and the Kolyma, Indigirka, and Yana river deltas of Arctic Russia. Post-breeding flocks of staging and molting spectacled eiders have been observed in Mechigmenan Bay (on the eastern coast of Russia's Chukotsk Peninsula), Alaska's Ledyard Bay (southwest of Point Lay), Peard Bay, Norton Sound, and 80 km south of Saint Lawrence Island. An estimated 7,370 spectacled eiders occupied the Arctic Coastal Plain of Alaska in June 2001 (Larned et al. 2001a), about 2 percent of the estimated 375,000 world population (Larned and Tiplady 1999).

From late December to early April, the only known wintering area of spectacled eiders is among leads in the pack ice southwest of St. Lawrence Island in the Bering Sea (Petersen et al. 1999). Leads in ocean ice are important pathways for marine bird and mammal species migrating along the Beaufort Sea coast in Alaska and Canada. All species of eiders use this lead system as well, flying at altitudes that are usually less than 30 meters (Johnson and Richardson 1982). Very little is known about migratory routes east of Barrow, but the definitive lead system transforms into numerous branches varying in location and extent from year-to-year. Because few spectacled eiders are observed in marine areas along the Beaufort coast in spring, a majority may migrate to the nesting areas overland from the Chukchi Sea (TERA 2002, review). Migration of eiders (the majority of which are king and common eiders) along Alaska's northern coast has been described in several studies (Thompson and Person 1963, Johnson 1971, Woodby and Divoky 1982). Spectacled eiders are observed in mixed flocks of king, common, and sometimes Steller's eiders, but the percentage of both spectacled and Steller's eiders is quite small.

Spectacled eiders arrive on North Slope breeding grounds paired, often in small flocks, in late May to early June. Spectacled eider nests are widely separated, nesting mainly from the Sagavanirktok River to the Chukchi Sea, and only sparsely to the east (Larned et al. 2001a). The highest densities determined from Service aerial surveys for eiders in 1998-2001 on the Arctic Coastal Plain east to the Arctic National Wildlife Refuge were found south of Barrow, with smaller areas east of Teshekpuk Lake, on the Colville River Delta, and near western Simpson Lagoon. Overall density was determined as 0.24 birds per square kilometer in 2001 (Larned et al. 2001a).

Male spectacled eiders begin to depart breeding areas during incubation, which coincides with late June on the North Slope. On the North Slope, the number of pairs peaks in mid-June and the number of males declines 4-5 days later (Smith et al. 1994, Anderson and Cooper 1994, Anderson et al. 1995). Following their late June departure from the nesting areas, males apparently make little use of the Beaufort before migrating to the Chukchi Sea.

During late June the Beaufort Sea has little open water, hence males present at breeding grounds east of Barrow normally do not use marine habitats and fly directly overland (most heading to a molting/staging area in Ledyard Bay) (TERA 2002, review). Later in the season (late June through September), when females depart the North Slope, much more of the nearshore zone is ice free. Open water in marine habitat allows for extensive use of the western Beaufort Sea. Radio telemetry studies have shown that most female spectacled eiders that migrate west toward Barrow use the nearshore zone of the Beaufort Sea as they transit to their molting/staging areas. The 13 female spectacled eiders tracked by Troy et al. (2002, review) primarily used the western Beaufort (71 percent of all bird-days) while areas near Stockton Island were also extensively used (17 percent of all bird-days). The females remained in the Beaufort Sea nearshore zone for an average of about 2 weeks (range 6-30 days).

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

Spectacled eider incubation lasts 20-25 days (Dau 1974, Kondratev and Zadorina 1992, Harwood and Moran 1993, Moran and Harwood 1994, Moran 1995). Hatching on the North Slope occurs from mid- to late July (Warnock and Troy 1992). Fledging occurs approximately 50 days after hatching. At this time, females with broods move directly from freshwater to marine habitats (Dau 1974, Kistchinski and Flint 1974).

On the nesting grounds, spectacled eiders feed by dabbling in shallow freshwater or brackish ponds, or on flooded tundra (Dau 1974, Kistchinski and Flint 1974). Food items include molluscs, insect larvae such as crane flies, trichopterans, and chironomids; small, freshwater crustaceans, and plants or seeds (Cottam 1939, Dau 1974, Kistchinski and Flint 1974, Kondratev and Zadorina 1992). Spectacled eiders in the marine environment feed predominately on clams and small amounts of snails, amphipods, and other bivalves. In March-April 1999 and 2001, studies within the spectacled eider wintering areas showed that the esophagi of collected eiders contained only clams, almost entirely *Nuculana radiata* with no trace of the once-dominant and preferred *Macoma calcaria* (Lovvorn 2002). Changes in the density of *Macoma calcaria* in the Bering Sea are coincident with an oceanic regime shift to warmer conditions in 1976-77 (Lovvorn et al. 2002 review). Exceptional climate change in the arctic and subarctic, and associated changes in marine communities and ice dynamics in spring, may have had important impacts on spectacled eiders whose declines of ~90 percent are largely unexplained.

The total population of spectacled eiders is estimated at 375,000 (Larned and Tiplady 1999). From the early 1970s to the early 1990s, numbers of pairs on the Yukon-Kuskokwim Delta declined by 96 percent from 48,000 to 2,000, apparently stabilizing at that low level (Stehn et al. 1993, Petersen et al. 1999). On the North Slope, the mean numbers of breeding spectacled eiders estimated from aerial surveys between 1993 and 2001 ranged from a high of almost 9,300 in 1993 to a low of 5,800 birds in 1996 and back up to 7,370 birds in 2001 (Larned et al. 2001b).

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

Lead ingestion from foraging habitat on breeding grounds in the Yukon-Kuskokwim Delta has been confirmed to cause mortality of eiders that ingested lead shot. The proportion of spectacled eiders on the Yukon-Kuskokwim Delta's lower Kashunuk River drainage that contained lead shot in their gizzards is high (11.6 percent, n=112) compared to other waterfowl in the lower 48 states from 1938-1954 (8.7 percent, n=5088) and from 1977-1979 (8.0 percent, n=12,880). The lead exposure rate in spectacled eiders (based on X-rays) is likely biased low (Flint et al. 1997), because lead is retained in the gizzard for only about 3 weeks (Elder 1954, Dieter and Finley 1978, Anderson and Havera 1986, Franson 1986, Anderson et al. 1987). Blood analyses of spectacled eiders indicate elevated levels of lead in 13 percent of pre-nesting females, 25.3 percent of females during hatch, and 35.8 percent during brood rearing. Nine of 43 spectacled eider broods (20.9 percent) contained 1 or more ducklings exposed to lead by 30 days after hatch (Flint et al. 1997). Spent lead shot in the lower Kashunuk River area and on Kigigak Island is causing additive mortality in spectacled eiders, that is, mortality over and above that caused by natural circumstances (Grand et al. in press). It is possible that exposure to lead occurs in small, localized hunting areas on the North Slope as well, however there are no site-specific data on lead contamination in this region.

Predation pressure on spectacled eider eggs, young, and adults may have increased in recent decades. Predators include Arctic foxes (*Alopex lagopus*), red foxes (*Vulpes fulva*), large gulls (*Larus* spp.), jaegers (*Stercorarius* spp.), and snowy owls (*Nyctea scandiaca*). Native elders on the North Slope believe that fox numbers have increased in recent decades as a result of reduced trapping. Population sizes of large gulls on the North Slope may have increased as a result of increased food supplies from anthropogenic wastes. Wastes made available from the commercial fishing industry in the Bering Sea and North Pacific, along with an increase in the garbage generated by coastal communities, have increased the year-round food supply for gulls.

Subsistence harvest of spectacled eider eggs and adults is another potential factor in the decline of the spectacled eider population. Alaska Natives have traditionally harvested eiders and their eggs in coastal villages during spring and fall. Although human populations on the Yukon-Kuskokwim Delta and in North Slope communities have grown substantially, changes in the numbers of hunters are unknown. In addition, improved technology for hunting has allowed greater efficiency, but the actual effects of these improvements on harvest levels are unknown.

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

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

Steller's Eider

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

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

Contemporary aerial breeding pair surveys conducted in late June indicate a population averaging about 1,000 birds from 1986-2000 (Mallek 2001). A separate set of aerial surveys,

timed in mid-June, indicates a smaller population, averaging about 200 birds from 1992-2001 (Larned et al. 2001b). These surveys likely underestimate actual population size, however, because an unknown proportion of birds are missed when counting from aircraft, and no species-specific correction factor has been developed and applied. Nonetheless, these observations indicate that hundreds or low thousands of Steller's eiders occur on the North Slope. These surveys do not demonstrate a significant population trend over the last decade. However, based on the observed interannual variability, it is estimated that it would take 14 years to detect a trend equivalent to a 50 percent change over 10 years (Larned et al. 2001a). Current sampling intensity is too low to provide useful trend data for this very rare species. There is some support for the hypothesis that Steller's eiders have abandoned formerly occupied areas in eastern portions of the North Slope; if true, this likely indicates that the Alaska-breeding population is in decline.

Steller's eiders spend most of the year in marine habitats. During winter, most of the Steller's eiders concentrate along the Alaska Peninsula from the eastern Aleutian Islands to southern Cook Inlet in shallow, near-shore marine waters (Jones 1965, Petersen 1980). They also occur in the western Aleutian Islands and along the Pacific coast, occasionally to British Columbia, along the Asian coast (from the Commander islands to the Kuril islands), and some are found along the north Siberian coast west to the Baltic States and Scandinavia (Palmer 1976, Cramp et al. 1977). In spring, large numbers concentrate in Bristol Bay before migration; in 1992, an estimated 138,000 Steller's eiders congregated there before sea ice conditions allowed movement northward (Larned et al. 1994).

Steller's eiders arrive in pairs on the North Slope in early June. Nesting effort varies widely from year to year. In the years from 1991-2001, there were 6 "nesting years" (1991, 1993, 1995, 1996, 1999, 2000) when typical breeding activities occurred, and 5 "non-nesting years" (1992, 1994, 1998, 2001) when birds appeared in early summer, but no nests were found and Steller's eiders are believed not to have nested (Quakenbush et al. 1995, Obritschkewitsch et al., unpublished data). Four nests were found in 1997, but these were initiated late (early July) and none survived past mid-incubation (Service/North Slope Borough), unpublished data). The reasons for the observed variation in nesting effort are unknown, but an association has been noted between nesting years and years of lemming abundance. Nest success could be enhanced in years of lemming abundance, because predators are less likely to prey on eider nests when small mammals are abundant. It has also been hypothesized that avian predators such as pomarine jaegers (*Stercorarius pomarinus*) and snowy owls (*Nyctea scandiaca*), which nest at high densities only when lemmings are abundant, may provide protection for nearby eider nests incidental to defense of their nesting territories (Quakenbush and Suydam 1999). If this hypothesis is correct, the presence of avian predators is an essential element of breeding habitat.

In nesting years, initiation dates are typically in the first half of June (Quakenbush et al. 1995), and hatching dates range from 7 July to 3 August (Quakenbush et al. 1998). Nests in Barrow are located in wet tundra, in areas of low-center polygons or low (indistinct flat-

centered) polygons, frequently within drained lake basins (Quakenbush et al. 1998). Average clutch sizes at Barrow ranged from 5.3-6.3 in 5 different years, with clutches up to 8 reported (Quakenbush et al. 1995). Nest success (proportion of nests at which at least 1 egg hatched) at Barrow averaged approximately 17 percent from 1991-2001 (Service, unpublished data). Egg loss was attributed mostly to predation by predators, including jaegers, common ravens (*Corvus corax*), and possibly glaucous gulls (*Larus hyperboreus*) and Arctic foxes (*Alopex lagopus*) (Quakenbush et al. 1995, Obritschkewitsch et al. 2001). The fledging period is not known, but is estimated to be 37 days (Obritschkewitsch et al. 2001). Broods most often used ponds with emergent grass (*Arctophila fulva*) (Quakenbush et al. 1998). Broods were reared close to their nest site; 8 broods tracked near Barrow in 1995 remained within 650m of their nest sites during the first 32 days after hatching (Quakenbush et al. 1998).

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

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

Causes of suspected population declines are not known. Possible causes currently being examined include community dynamics of nesting avian populations in the Barrow area, artificial increases in predator populations on the North Slope, subsistence harvest and lead contamination.

ENVIRONMENTAL BASELINE

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

Status of Spectacled Eiders and Steller's Eiders Within the Action Area

Currently, no trend is discernible in spectacled and Steller's eider population sizes on the North Slope. Furthermore, the factors that limit population size on the North Slope have not been identified. Therefore, it is impossible to determine whether human activity and habitat alteration have affected the status of the species in the project area. However, factors that may have affected the status of the species in the project area include loss of breeding habitat, disturbance from oilfield operations, research efforts, lead contamination, increases in predator populations, and subsistence harvest.

Factors Affecting Species Environment Within the Action Area

Breeding habitat on the North Slope has remained largely unaltered and uninhabited by humans. A small portion of the species' potential breeding range has been altered by oil and gas development. Within the last decade oil and gas development has spread out from the coastal plain near Prudhoe Bay to offshore platforms in the Beaufort Sea to the borders of the Arctic National Wildlife Refuge in the east and the Colville River in the west. Since 1979, 7 OCS lease sales have been held and 30 OCS exploration wells have been drilled in the Beaufort Sea Planning Area. In 1999, the Service has completed Section 7 consultation on a development and production plan for the Northstar Project, which straddles Alaska State and Federal waters (Lease Sale 186 EIS). Northstar began production on October 31, 2001. The Service also completed consultation on a development and production plan for the Liberty Project, which is wholly located on the Federal OCS. A final EIS for the Liberty Project was published in May 2002. The applicant, BP Exploration (Alaska) Inc., announced that it has suspended work on the project pending a re-evaluation of project costs. The future of this project is uncertain. Impacts of oil development include construction, accidental spills of toxic materials, off-road vehicle use, wetland filling, and indirect effects of human presence in areas previously uninhabited.

Human population growth in the vicinity of Barrow and other North Slope communities has also resulted in localized habitat loss due to construction activities and off-road vehicle use. On-road and off-road vehicle traffic are potential sources of disturbance. Steller's eider research conducted jointly by the Service and North Slope Borough is also a source of disturbance, because those activities are oriented toward locating nests and broods. One nest

was depredated in 2000 as a likely result of nest-search disturbance, when a nest was left exposed to a jaeger because of the proximity of the researcher (Service, unpublished data). Nest abandonment, in the absence of predation, has only been documented as a result of research-related trapping and handling of an incubating hen; it is possible, however, that chronic human disturbance close to a nest could cause abandonment.

Lead or other sources of contamination of habitat or prey species are possible in localized areas within the range of Steller's and spectacled eiders. Exposure of waterfowl to lead has been documented in the range of the Alaska-breeding population of Steller's eiders. Elevated blood and tissue lead levels, morbidity, and mortality from lead poisoning were found in spectacled and common eiders (*Somateria fischeri* and *S. mollissima*, respectively) on the Yukon-Kuskokwim Delta (Franson et al. 1995, Flint et al. 1997, Flint and Herzog 1999). On the breeding grounds near Barrow, one Steller's eider found dead in June had liver and kidney lead concentrations suggestive of lead poisoning, although several other Steller's eiders examined at the same time of year had lower lead tissue concentrations (Trust et al. 1997, Service, unpublished). Blood samples from nesting hens trapped near Barrow in 1999 and 2000 showed that all (8 of 8) had concentrations exceeding the clinical threshold for lead exposure and 7 of 8 exceeded thresholds for lead poisoning in waterfowl.

Often, with increases in human presence, there is a concomitant increase in nest predator populations such as gulls, ravens, and foxes. Residents of Barrow and other North Slope communities have observed an increase in populations of gulls and arctic foxes. There is very little information on predation of Steller's and spectacled eider nests throughout most of the species' range in Alaska. Near Barrow, however, Steller's eider nest success in recent years has been very poor. Of 186 nests found from 1991-2000, only 15-18 percent survived until hatching, with predation thought to be the primary factor causing nest failures (Quakenbush et al. 1995, Obritschkewitsch et al. 2001). In addition to causing complete nest failures during incubation, predators at Barrow further reduced productivity through partial predation (where some but not all eggs in a nest were taken) and by killing ducklings that survived the incubation period (Quakenbush et al. in prep.). Studies of nest predation in other areas have reported mixed results. For example, "apparent" nest success on the Indigirka River Delta, Russia in 1971 was 10-15 percent, and eiders nesting near gull nests had higher nesting success (Kistchinski and Flint 1974, Mayfield 1975). However, in 1994 nest success was <2 percent and nest predators such as Arctic foxes, glaucous and herring gulls, and parasitic and pomarine jaegers are suspected to have depredated most of the nests (Pearce et al. 1994). Also, nearly complete predation of spectacled eider nests by jaegers and foxes was recorded on the Chaun River Delta, Russia after a June snow storm (Kondratev and Zadorina 1992). Predation by gulls, jaegers, and Arctic foxes probably affects the survival of Steller's and spectacled eider eggs and ducklings throughout the species' range.

Sport hunting for Steller's and spectacled eiders was closed in 1991 by Alaska State regulations and Service policy. Outreach efforts have been conducted by the North Slope Borough and Service to inform hunters of these closures. Accurate information on current

harvest rates is not available, but hunter surveys and other observations indicate that hunting of Steller's and spectacled eiders likely continues in Northwest Alaska (Paige et al. 1996, Georgette 2000, Wentworth 2001).

Conservation efforts also affect spectacled eiders and their habitat within the action area. The Service provides project applicants with recommendations and restrictions intended to minimize impacts of oilfield activities on spectacled eiders. These include timing restrictions and buffers around known nest sites and likely benefit spectacled eiders at the individual level.

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

EFFECTS OF THE ACTION ON LISTED SPECIES

Helicopter Overflights

Nesting Steller's and spectacled eiders could be disturbed by helicopter overflights related to exploration and delineation activities. However, disturbance to nesting spectacled and Steller's eiders is unlikely due to their extremely low densities across the North Slope. Across the Arctic Coastal Plain of the North Slope, breeding season density averages approximately one pair per 8 km² for spectacled eiders (Larned et al. 2002a). Steller's eiders are so rare in some years that they are not detected at all by aerial survey methods. In the core Steller's eider breeding area near Barrow, the highest density recorded in 4 years of aerial surveys was estimated as approximately one pair per 12.5 km (Ritchie and King 2002). Densities elsewhere on the Arctic Coastal Plain are much lower, and may approach zero.

The number of helicopter trips flown in support of exploration- and delineation-well drilling is assumed to range from about 90-270 each year, depending on the number of wells (1-3) that are drilled. For each drilling operation, it is assumed that there would be one flight per day of drilling. The time required to drill and test a well is about 90 days. Most flights will transport employees between Deadhorse and as yet unspecified exploration sites.

Heavy helicopter traffic could adversely affect spectacled eiders by: 1) displacing adults and/or broods from preferred habitats during pre-nesting, nesting, brood rearing and migration; 2) displacing females from nests, exposing eggs or small young to inclement weather or predators; and 3) reducing foraging efficiency and feeding time. The behavioral response of eiders to aircraft overflights is unknown; some spectacled eiders nest and rear broods near the Deadhorse Airport, indicating that some individuals may tolerate frequent aircraft noise. Individual tolerances are likely to vary, however, and the intensity of disturbance associated with the proposed action would, in some cases, be greater than that experienced by birds near the airport. Some birds may be displaced, with unknown

physiological and reproductive consequences. The number of eiders that would be exposed to helicopter overflights is variable, however. This is, in part, because the potential flight paths to drilling sites within the Lease area could range from short (e.g., a direct route from Deadhorse to Beaufort Sea) to lengthy (e.g., a flight path to a remote site 25 mi. north of Barrow). Because most oil exploration and development in the Lease Sale 186 area is anticipated to occur in the Near and Mid Zone areas close to primary support facilities at Deadhorse and vicinity, spectacled eiders in the Deadhorse area are much more likely to be overflown than those in more distant portions of the lease area.

In conclusion, while helicopter overflights potentially could cause adverse effects to individuals of either species of listed eider, their low nesting densities and low use of nearshore areas during migration, suggest that few individuals would likely be impacted. Likewise, the wide range of tolerances found in individual birds to this type of potential disturbance make it difficult to predict whether adverse impacts would actually occur. Finally, the EIS indicates that the most likely locations for exploration are in the Near and Mid zones. Steller's eiders are extremely rare in these zones, and the probability of affecting large numbers is diminished because of the relatively short flight paths.

Onshore Bases and Pipelines

Disturbance to Steller's and spectacled eiders from onshore bases and pipelines is also possible. The level of disturbance anticipated is highly variable depending on the zone within the OCS within which future development actually occurs. For the Near Zone, an area anticipated to receive over 70 percent of all development, MMS expects that no new landfalls, shore bases, or new onshore processing facilities would be required. For development within the Mid- and Far Zones, projects could involve new pipeline landfalls and shore bases. Because the Mid- and Far Zones are mostly beyond the influence of existing infrastructure on the North Slope, new development projects could introduce significant changes to the level of disturbance experienced at landfall areas. The MMS's Lease Sale 186 EIS states that route selection and installation of offshore pipelines could occur either in the summer open-water season or during mid- to late winter when landfast ice has stabilized. New onshore pipeline sections would be constructed simultaneously with the offshore pipeline installation. Because onshore pipelines and support bases may be constructed during the summer breeding season, there is potential for disturbance to nesting spectacled eiders. Observations from Prudhoe Bay suggest that spectacled eiders exhibit some tolerance of facilities (including pipelines) and service roads (TERA 1996). Telemetry studies in 1993 and 1994 showed broods spending time within 200 m (656 feet) of facilities, and crossing roads (five known broods in 1995 and two in 1994).

The development of onshore bases and pipelines would only occur in support of oil production and thus is not a part of the leasing and exploration action being considered in this incremental consultation other than with regard to the jeopardy determination. Although construction and operation of onshore bases may displace and/or disturb individual eiders, the

total area affected is not expected to result in population-level impacts. If onshore bases and additional pipelines to transport produced oil and gas are proposed in the future, the impacts of those actions would be fully considered when consultation is requested on that increment of the OCS program.

Exploration, Production and Support Activity

Encounters between marine seismic equipment, offshore drilling, dredging, and vessels involved in ice breaking and threatened eiders at sea is also a possibility. During the open-water season, MMS assumes various levels of seismic-survey activity and supply boat support. Site-specific surveys of the exploration and delineation well sites would be conducted during the ice-free seasons of the years of the exploratory phase. The MMS estimates each survey would cover roughly 23 square kilometers for each exploration well and last between 2 and 5 days. The annual number of supply boat trips per open-water season could be as high as 14.

If exploration occurs between October and May, the probability of exploratory activities (not including accidental discharge of oil) in the Beaufort Sea resulting in encounters with spectacled or Steller's eiders would be low. This probability increases, however, if the action occurs between May and October because of the presence of spectacled and Steller's eiders migrating across the Chukchi and Beaufort seas to reach breeding grounds in the spring and when migrating to molting/staging areas in the summer and fall.

Extensive nearshore and offshore aerial surveys in the Beaufort Sea in 1999 and 2000 failed to detect concentrations of spectacled eiders (no Steller's eiders were observed), except for two flocks (numbering 40 and 100) offshore in the Harrison Bay area (Fischer et al. 2002). Given the rarity of these species, we assume that few threatened eiders would encounter vessel traffic. We surmise that eiders would avoid such encounters by diving or flying away, that the frequency of those disturbances will not reach the threshold that would impair survival, and that alternative suitable habitat is available. Under these conditions, take is unlikely, and would not reach a population-level effect.

Collisions with Drilling Structures

Migrating birds are at risk of collision with objects in their path, particularly when visibility is impaired during darkness or inclement weather, such as rain, drizzle, or fog (Weir 1976). The incidence of bird strikes appears to rise when objects are illuminated with constant diffuse light, and the tendency for birds to be drawn to diffuse light appears to increase during rainy or foggy weather. Accidental strikes of "hundreds" of unidentified eiders were reported to have occurred in association with the Bering Sea crab fishery, presumably influenced by the bright lights used on fishing vessels (Service 1996). Comparisons have shown that blinking lights cause less mortality than constant lighting, and the color of the

lights and the object may influence collision frequency (Weir 1976). Cross-sectional area also affects the number of birds that strike an obstruction.

Johnson and Richardson (1982) reported that 88 percent of eiders flew below an estimated altitude of 10 m (32 feet) and well over half flew below 5 m (16 feet). Recently, (September/October 2001) several sea duck fatalities as a result of platform strikes were documented at Northstar Island, a production platform within the Lease Sale 186 area. In 2001, 18 birds were retrieved at Northstar Island, all sea ducks, including 4 king eiders, 6 common eiders, and 8 long-tailed ducks (Service, unpublished). The densities of Steller's and spectacled eiders on the North Slope are much lower than those of the species found dead at Northstar. Therefore the potential for them striking OCS oil platforms is much lower. Although information specific to spectacled eider flight behavior is lacking, a spectacled eider was seen striking a utility wire near an electric light in white-out conditions on St. Lawrence Island in 1998 (Service, unpublished).

Several structures associated with exploration and delineation wells may pose a risk to migrating eiders, including crane boom, drilling rigs, and other buildings. Although the total profile of exploratory and delineation wells and associated structures is small relative to the Beaufort Sea, the Service believes that the structures pose a risk to migrating eiders, including spectacled and possibly Steller's eiders, because: 1) the Lease Sale 186 area contains the "main route" used by female eiders migrating west through the Beaufort Sea, speculated to be "just north of the barrier islands" (Johnson and Richardson 1982); 2) the artificial lighting associated with drill rigs may serve as a magnet to migrants, particularly during fog and rain (Weir 1976); and 3) the flight altitude of migrating eiders is low and within the height range of exploration and production facilities.

It is estimated that 47 percent of the North Slope spectacled eider population breeds to the east of Barrow, and it is a reasonable (though unproven) assumption that birds breeding west of the project infrastructure do not wander eastward (Service, unpublished). The likelihood of death or injury as a result of collision is diminished because recent radio telemetry studies have shown that few male spectacled eiders migrate through the Beaufort Sea on their way from their North Slope breeding grounds to molting/staging areas in the Chukchi Sea (TERA 2002 review). Females nesting east of Barrow have been shown to utilize the western regions of the Beaufort Sea extensively en route to molting/staging areas (TERA 2002, review). Therefore, based on our understanding of the biology of the species, their migration routes, distribution, and behavior, we believe that there is some risk of injury or death of some individuals from collisions with oil and gas exploration and delineation structures. However, the best available scientific and commercial information does not lead us to believe that significant population-level impacts are likely to result from the proposed action.

Increase in Predator Populations

Several North Slope predators that prey on waterfowl eggs and young concentrate in areas where anthropogenic food sources are made available. Examples include glaucous gulls, ravens, and Arctic foxes that are abundant near camps, roads, oilfields, and villages. For ravens and foxes, there is evidence showing population increases and/or changes in distribution in response to anthropogenic food sources, and the breeding distribution of ravens has expanded on the North Slope because buildings and other structures in oil developments provide nesting sites (Day 1998). The predation pressure that foxes and, to a lesser degree, gulls and ravens, exert on ground-nesting birds is also well documented, and in some areas predation may be the single most important factor affecting nest success (ibid.).

Spectacled and Steller's eiders may be adversely affected by increased numbers or distribution of predators. Ravens apparently never successfully nested in Barrow until 1991 when a single pair began raising a brood each year on a man-made structure. In 1991, one of these ravens was seen depredate five eggs from two Steller's eider nests (Quakenbush et al. 1995). Although information showing a direct link between oilfield activities and waterfowl nest predation rates is lacking, the Service believes that actions that artificially enhance predator populations are a potential adverse impact to listed eiders.

The development of significant permanent infrastructure would only occur in support of oil production and thus is not a part of the leasing and exploration action being considered in this incremental consultation other than with regard to the jeopardy determination. If permanent infrastructure is proposed in the future, the impacts of those actions would be fully considered when consultation is requested on that increment of the OCS program including their potential impacts on predator populations. Based on the limited number and ephemeral nature of exploratory drilling rigs, we do not believe that these will affect predator populations sufficiently to cause impacts to threatened eiders on the population level.

Oil Spills

Spilled oil can have significant impacts on birds. Exposure to oil can affect birds in several ways. Most birds exposed to oil die within a short period of time, often through loss of the insulative properties of their plumage so that hypothermia ensues (Hunt 1987, Piatt et al. 1990). Embryos or young can be killed by contact with adults that have oiled plumage (King and Lefever 1979, Peakall et al. 1982). Birds that ingest contaminated food can suffer fatal toxicological effects (Peakall et al. 1983). Species that feed on invertebrates or other organisms that bioaccumulate and/or biomagnify toxins are particularly vulnerable.

Oil spills and associated clean-up could result from the proposed project. Potential sources of a spill include a drilling blowout, failure of diesel fuel storage tanks on exploratory islands, rupture of pipelines (loss > 0.15 percent of flow rates), chronic leaks from the pipelines (loss < 0.15 percent of flow rate), or spills from barges or trucks used to transport fuel oil to

exploratory and delineation rigs. Historical data from North Slope oil production show that between 0 and 102 spills per year occurred from 1970-1997; most were small spills, as mean spill size in all years was <100 bbl (Lease Sale 186 EIS). Small spills, although the most likely, have the least impact to wildlife populations because a smaller area is affected and fewer individuals are likely to be exposed. Similarly, spills in the terrestrial environment, though possible, will likely have minimal impact because the density of Steller's and spectacled eiders is relatively low in the project area and spills on land spread slowly and will be more easily detected and contained. Therefore, the Service considers the possible impacts from small marine spills and spills in the terrestrial environment to be unlikely to affect more than a few individual Steller's and spectacled eiders. Thus, the remainder of this discussion will focus exclusively on medium or large ($\geq 1,000$ bbl [42,000 gal]) spills in the marine environment.

The expected impacts of oil spills depends on how accurately spill characteristics, as well as the distribution and behavior of the birds are predicted. Estimating the probability of spills is fundamental: if no oil is spilled, there will be no impacts. If one or more spills occur, characteristics such as volume, trajectory, and timing will greatly influence the impact on eiders. Patterns of use of the Beaufort Sea by Steller's and spectacled eiders are equally relevant. Evaluating the likelihood of spills from exploration and delineation is constrained by the small number of comparable projects in the Beaufort Sea. The Lease Sale 186 EIS estimated that the risk of one or more spills of at least 1,000 bbl (42,000 gal) over the life of the project is 8-10 percent. Oil-Spill-Risk Analysis modeling within the Lease Sale 186 EIS estimates that if such a spill does occur the chance that listed eiders will come in contact with spilled oil in nearshore or offshore areas ranges up to 55 percent in summer; along the shoreline contact probability is less than 8 percent. No estimates of spill risk from barges or trucks used to transport fuel oil to exploratory and delineation sites were given in the Lease Sale 186 EIS.

Cleanup of a spill in the Beaufort is anticipated to be limited by ice and weather conditions in the area. In many cases, final cleanup of an oil spill may only be possible from early July through August after the Lease Sale 186 area is ice free (National Research Council 1994). Because of unstable and broken ice conditions in the area, once a leak is detected, response for containment and cleanup of a spill will be delayed or hindered during 6 months of the year, and then only as weather permits. In addition, historical recovery rates of spilled oil are traditionally very low even when cleanup is not hampered by Arctic weather and frozen or partially frozen seas. Based on national and international data, recovery rates of 20-25 percent are considered high and are usually not above 10 percent (Alaska Department of Environmental Conservation 1998, National Research Council 1994).

Oil spill response activities such as hazing and other human activities (boat and air traffic) could also impact spectacled eiders. Hazing, according to the Lease Sale 186 EIS, may have limited success during spring when migrants occupy open water in ice leads. The hazing effect of cleanup activity or actively hazing birds out of ice leads that oil is expected to enter

may be counterproductive, because there are few alternative habitats that flushed birds can occupy. Cleanup activities in leads during May and open water in July through September are likely to adversely affect spectacled eiders.

In summary, accidental oil spills can have significant impacts on birds as a result of direct and indirect contact. Potential sources of a spill include a drilling blowout, failure of diesel fuel storage tanks on exploratory islands, rupture of pipelines, chronic leaks from the pipelines, or spills from barges or trucks used to transport fuel oil to exploratory and delineation rigs. Small spills are the most likely to occur but that also have the least potential impact to listed species because a smaller area is affected and fewer individuals are likely to be exposed. Similarly, spills in the terrestrial environment will likely have minimal impact because the density of Steller's and spectacled eiders is relatively low in the project area and spills on land spread slowly and will be more easily detected and contained. Large spills ($\geq 1,000$ bbl [42,000 gal]) spills in the marine environment are of a greater concern, however, the risks during exploration and delineation are significantly less than during production, which the EIS indicates is 8-10 percent over the life of the proposed project. The probability of a large oil spill contacting a significant number of spectacled or Steller's eiders is further diminished by considerations of timing, ice and weather conditions, effectiveness of spill response, and the dispersed nature of the birds' distribution. The coincidence of all those factors which would have to occur simultaneously in order to appreciably reduce the likelihood of survival and recovery is improbable. Thus, we conclude that such an impact is not reasonably certain to occur.

Toxics Contamination

Leasing and exploration may also result in increasing contamination of marine habitats, due to the disposal of drilling muds and cuttings, or accidental eruption of oil from test wells during a blowout. Such contamination may impact individuals either through direct contact or indirectly as a result of effects on prey populations or important habitats. Information provided by the MMS indicates that industry's record on the Outer Continental Shelf allows the assumption of a probability of crude-oil release during exploration to be zero, however the potential for such an occurrence exists.

The Lease Sale 186 scenario developed by the MMS, which this opinion will assume, indicates that 6 exploration and 6 delineation wells are expected to be drilled during the period 2004 through 2010. A maximum of two drilling rigs would be operable in any one exploratory year, assuming one exploration rig per platform. Discharges as a result of these wells are regulated by the Environmental Protection Agency through a National Pollutant Discharge Elimination System (NPDES). The EPA initiated consultation with the Service in January 1994 to determine the likelihood that the proposed discharges associated with exploratory drilling would adversely affect listed species. The Service concurred with the EPA that the proposed NPDES permit issuance would not be likely to adversely affect listed species. Therefore, the EPA and MMS have already satisfied the requirements of the

Endangered Species Act regarding effluent discharges associated with oil and gas exploration in the Beaufort and Chukchi seas (State and Federal waters).

CUMULATIVE EFFECTS

Cumulative effects include future State, 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.

State or private actions reasonably certain to occur within or near the proposed sale area would include: State of Alaska oil and gas lease sales, exploration, development, and production; gravel mining, support facility and road construction to support these activities as well as pipelines and related oil and gas transport facilities, including feeder lines, Trans-Alaska Pipeline operation and maintenance; possibly some future Canadian Beaufort Sea oil and gas activities; land reconveyances from Native corporations to private individuals; subsistence harvest activities; commercial fishing; marine shipping; and recreational activities.

CONCLUSION

After reviewing the proposed action, the current status of spectacled and Steller's eiders, the environmental baseline for the action area, the effects of the proposed action, and the cumulative effects, it is the Service's biological opinion that Beaufort Sea Oil and Gas Lease Sale 186 and associated activities, as proposed, are not likely to jeopardize the continued existence of the spectacled and Steller's eider. There is no designated or proposed critical habitat on the North Slope for spectacled or Steller's eiders.

Regulations (51 FR 19958) that implement Section 7(a)(2) of the Act define "jeopardize the continued existence of" as "to engage in an action that reasonably would be expected, directly or indirectly, to reduce appreciably the likelihood of both the survival and recovery of a listed species in the wild by reducing the reproduction, numbers, or distribution of that species." In evaluating the impacts of the proposed Lease Sale 186 to Steller's and spectacled eiders, the Service identified a series of direct impacts that could result, such as disturbance from helicopter overflights, collisions with drill rig facilities by migrants, and changes in the number or distribution of predators. However, the Service believes that the combined impacts to spectacled and Steller's eiders through these avenues will be minimal for the reasons given in the *Effects of the Action* section of this biological opinion. The widely dispersed nature of these two species, both onshore and offshore in the Beaufort Sea region, reduces their vulnerability to perturbations of limited geographic scope.

The Service believes that the greatest risk to listed species from the proposed Lease Sale 186 is potential impacts from accidental oil spills in the marine environment. However, as noted

above, for the project to jeopardize the continued existence of spectacled eiders, an appreciable reduction in the likelihood of both the survival and recovery of one or both species must be "reasonably expected to occur." Thus, when determining whether possible oil spills jeopardize listed species, the Service must consider the following: 1) the likelihood of one or more spills occurring; and 2) if one or more spills occur(s), the likelihood that the spill(s) will kill enough spectacled eiders to appreciably reduce their likelihood of survival and recovery.

The likelihood of one or more large spills $\geq 1,000$ bbl in size occurring during the lifetime of Lease Sale 186 is estimated to be 8-10 percent. Assuming factors similar to Northstar, the likelihood of a very large spill (blowout) $\geq 150,000$ bbl in size occurring during the lifetime of Lease Sale 186 is 9.4×10^{-7} . However, the impacts of a spill to biological resources (e.g., eiders) vary with spill volume, spill trajectory, whether the resource is present during the time of year that spilled oil is present, and the length of time that oil persists in the environment. This is exemplified by Stehn and Platte's (2000) model, which estimated mortality from a 30 day spill in July caused by exploratory activity within the Lease Sale 186 area at 2-52 spectacled eiders. While if a 30 day spill were to occur throughout August during the period of active westward migration, mortality resulting from a large spill is estimated to be ≤ 100 individuals. Although the estimates of spill probability and impacts to threatened eiders are constrained by lack of information on oil development, subsea pipeline safety, and numbers/locations of threatened eiders in the region, the available information leads the Service to conclude that an appreciable reduction in the likelihood of survival and recovery of listed eiders is not reasonably expected to occur.

INCIDENTAL TAKE STATEMENT

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

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

Helicopter Overflights

Disturbance from helicopter overflight to Steller's and spectacled eiders is unlikely because over most of the lease area, there is a low probability that the few areas occupied by scattered flocks during the spring to fall staging and migration periods would be overflown routinely by support aircraft flying between a few offshore drill sites and onshore facilities. A potential exception might be spectacled eiders occurring in coastal or offshore portions of the Near Zone or western Midrange Zone areas that are relatively close to primary support facilities at Deadhorse. Eiders in this vicinity may be more likely to be overflown than those in the more distant portions of the lease area. However, few eiders remain for long in marine waters in the immediate vicinity of Prudhoe Bay and therefore disturbance would be minimal (TERA 1997, 1999).

As described in the *Effects of the Proposed Action* above, spectacled and Steller's eider adults and/or broods may occur below or adjacent to helicopter routes. However, the Service does not anticipate that helicopter flights associated with Lease Sale 186 will result in take of spectacled or Steller's eiders due to low recorded densities of breeding and migrating spectacled eiders in the project area and observed tolerance of nesting spectacled eiders to overhead flights near Deadhorse airport.

Exploration, Production and Support Activity

Because Steller's eiders using the marine environment rarely occur in the Near or Midrange Zones from Harrison Bay east, where 90 percent of the Lease Sale 186 leasing activity and development projects are expected to occur, it is unlikely that the action will generate major disturbance. Because of the large amount of nearshore habitat available to spectacled eiders in the Beaufort Sea, spectacled eiders staging or migrating in offshore water are not likely to experience significant disruption of foraging or displacement as a result of routine exploration, development, or support activities during the open-water season.

Despite potential encounters with exploration and support activities at sea, eiders typically avoid such encounters by diving or flying away from such disturbance. Substantial adverse effects on spectacled or Steller's eiders resulting from offshore marine activities in the vicinity of the proposed area of the action are unlikely. Therefore, the Service does not

anticipate that disturbance from exploration, production and support activity will result in take of spectacled or Steller's eiders.

Collisions with Drilling Structures

The Service anticipates that some level of take of spectacled and/or Steller's eiders may result from collisions with exploratory, delineation and production drilling structures. Such losses may affect the regional population of spectacled eiders, which shows a non-significant downward trend in the past decade, and Steller's eiders, which shows a nonsignificant upward trend over the same time period. However, the MMS's uncertainty over locations, number and size of drilling platforms within Lease Sale 186 makes quantifying potential bird strikes difficult. Also, limited information available on spectacled and Steller's eider migration routes, behavior, and vulnerability to obstructions when migrating further complicates estimating anticipated take. However, the anticipated footprint of all exploratory and production platforms is likely to be relatively small within the Lease Sale 186 area (3.95 million hectares) and the majority of eiders encountering platforms during migration are likely to miss or avoid the obstruction.

Estimating incidental take of Steller's and spectacled eiders from strikes is extremely difficult due to a lack of available information on sea duck strikes coupled with uncertainty over potential numbers, locations, seasonality and duration of potential Beaufort OCS activities. Limited data is available for common eider (*Somateria mollissima v-nigra*) strikes to Northstar Island, which is located within the Lease Sale 186 area. From this data it is possible to generate a generic strike rate for sea ducks per well-year by dividing the number of common eider strikes (6) to Northstar Island in 2002 by the most recent population estimate of common eiders migrating west over the Beaufort Sea (111,635) (Suydam et al. 1996, Service, unpublished). That number is then multiplied by the North Slope population estimates for spectacled (7,370) and Steller's eiders (433) (Larned et al. 2001a) to give a "strikes per well year" estimate for both species. The results of this methodology indicate that 0.40 spectacled and 0.02 Steller's eiders will be taken per well-year as a result of colliding with drill rigs and/or other exploratory and delineation structures.

The Lease Sale 186 EIS states that no more than two drilling rigs would operate at any time, with a total of 6 exploration and 6 delineation wells expected to be drilled over a 7-year exploration period. Therefore, the Service anticipates that the maximum number of exploration and/or delineation wells drilled within the Beaufort Sea resulting from the MMS's Lease Sale 186 would be twelve. Twelve wells result in 12 well-years, from which we estimate take of five spectacled and one Steller's eider over the life of the proposed leases.

It is important to note that the above estimates for incidental take from strikes to drill rigs are crude. The estimates do not take into consideration that eider strikes are episodic in nature, many spectacled and most Steller's eiders never migrate through the Beaufort Sea, and that

the strike rates are generated from only 1 year of data at a single location in the Lease area. Therefore, as more data on eider strikes to OCS platforms in the Beaufort Sea becomes available, the MMS may need to reinitiate consultation if observed strike rates are higher than the above anticipated incidental take level.

Increase in Predator Populations

State of Alaska, Department of Environmental Conservation regulations that govern refuse management in oilfields include provisions to make it illegal for any person to intentionally feed wildlife or leave human food or garbage in a manner that attracts wildlife [5 AAC 92.230]. The Service assumes that the applicant will completely comply with all applicable regulations governing waste management, and therefore anticipates that no incidental take of listed eiders will result from an increase in predator abundance caused by improper waste management.

Oil Spills

If a large oil spill occurred in the location of and during spectacled eider presence, spectacled eider mortality likely would be ≤ 100 individuals; however, any substantial loss (25+ individuals) would represent a significant effect (MMS Lease Sale 186). It is unlikely that take of Steller's eiders will result from a large oil spill in late spring or in early summer unless atmospheric and oceanic conditions were such that spilled oil dispersed towards Barrow and into the Chukchi Sea. The MMS's Lease Sale 186 Oil-Spill-Risk-Analysis modeling runs predict the probability of such a spill scenario to be very low.

Extent of take that will result from oil spills from the proposed action is extremely difficult to estimate. First, it is uncertain that oil will be spilled. As stated in the biological evaluation, the likelihood of at least one spill of at least 1,000 bbl (42,000 gal) during the life of the project (~26 years) is currently estimated to be 8-10 percent. In the unlikely event of such an oil spill, the extent of take will be greatly influenced by the number, volume, trajectory, and timing of spills as well as the period that oil remains in the environment. In addition, the low probability of such an event, combined with the uncertainty of the location of the spill, and the seasonal nature of the resources inhabiting the area, make it highly unlikely that a large oil spill would contact a threatened eider. Spectacled and Steller's eiders are present on the North Slope for only 3-5 months out of the year. Even if an eider were present in the vicinity of an oil spill, it might not be contacted by the oil due to avoidance behavior, ice conditions or weather patterns. Furthermore, the MMS requires companies to have and implement oil-spill-response plans to help prevent oil from reaching critical areas and to remove oil from the environment. Therefore, the probability of a large oil spill contacting a Steller's or spectacled eider is much less than 8-10 percent over the 30 year life of the proposed leases (2003-2033).

Considering the low probability of a large spill coupled with a variety of other factors that would need to be satisfied to result in take, the Service anticipates that it is highly unlikely that incidental take of listed eiders will result from oil spills within the Lease Sale 186 area. However, should any oil spill within the Lease Sale 186 area result in the take of any Steller's or spectacled eider, the MMS will immediately cease all operations responsible for the take pending reinitiation.

Toxics Contamination

The EPA initiated consultation with the Service in January 1994 to determine the likelihood that the proposed discharges associated with exploratory drilling would adversely affect listed species. The Service concurred with the EPA that the proposed NPDES permit issuance would not be likely to adversely affect listed species. Therefore, the EPA and MMS have already satisfied the requirements of the Endangered Species Act regarding effluent discharges associated with oil and gas exploration in the Beaufort and Chukchi seas (State and Federal waters). The Service anticipates that no incidental take of listed eiders will result from an increase in discharges associated with exploratory drilling.

Conclusion

In conclusion, the Service anticipates the proposed action will likely result in the take of five spectacled and one Steller's eiders over the life of the lease sale as a result of bird collisions with exploratory and delineation structures. The take is expected to be in the form of killing. In the accompanying Biological Opinion, the service determined that this level of anticipated take is not likely to result in jeopardy to the species or destruction or adverse modification of critical habitat.

While the incidental take statement provided in this consultation satisfies the requirements of the Act, as amended, it does not constitute an exemption from the prohibitions of take of listed migratory birds under the more restrictive provisions of the Migratory Bird Treaty Act. However, the Service will not refer the incidental take of any migratory bird or bald eagle for prosecution under the Migratory Bird Treaty Act of 1918, as amended (16 U.S.C. §§ 703-712), or the Bald and Golden Eagle Protection Act of 1940, as amended (16 U.S.C. §§ 668-668d), if such take is in compliance with the terms and conditions (including amount and/or number) specified herein.

Reasonable and Prudent Measures

The Service believes that the following reasonable and prudent measures are necessary and appropriate to minimize take of Steller's and spectacled eiders: to minimize the likelihood that migrating spectacled or Steller's eiders will strike exploration or delineation structures, the MMS and the Service will cooperatively develop a lighting protocol intended to reduce

radiation of light outward from structures and to increase the visibility of structures to migrating eiders.

Terms and Conditions

In order to be exempt from the prohibitions of Section 9 of the Act, the MMS 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.

To minimize the likelihood that migrating spectacled or Steller's eiders will strike structures associated with exploration and delineation drilling, the MMS and Service will cooperatively develop a lighting protocol to be used on exploration and delineation structures and identify where and when the protocol should be applied. The lighting protocol will contain the following two components:

1. The radiation of light outward from exploration/delineation structures will be minimized. This will be achieved by shading and/or light fixture placement to direct light inward and downward to living and work surfaces while minimizing light radiating upward and outward.
2. Structures will be lighted and/or marked to improve visibility to migrants according to a strategy to be jointly developed by the MMS and the Service.
 - a) This strategy will be developed using available information on bird avoidance measures including, but not limited to, results of the ongoing study of lighting regimes for Northstar Island being conducted by BP Alaska, ABR, Inc., and the Service.
 - b) A draft strategy will be provided by the Service to MMS by December 31, 2003; the final strategy must be mutually agreed upon by the MMS and Service by April 1, 2004, or a later date that is mutually agreed upon.
 - c) This strategy applies to all exploratory and delineation structures used after April 1, 2004, because bird avoidance measures that provide unequivocal benefits are not available at this time.
 - d) Any lighting requirements resulting from strategy need not apply between October 31 and May 1, because listed eiders are not thought to be present in the Beaufort Sea during this period.
 - e) This strategy will be modified, as appropriate, if significant new information on bird avoidance measures becomes available during activities

covered by this consultation. Modifications to the strategy will be developed jointly by MMS and the Service.

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

CONSERVATION RECOMMENDATIONS

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

1. The MMS should work with the Service and other Federal and State agencies in implementing recovery actions identified in the spectacled and Steller's eider recovery plans. Research to determine important habitats, migration routes, and wintering areas of spectacled and Steller's eiders would be an important step toward minimizing conflicts with current and future oil and gas development activities.
2. The Service believes that having oil industry employees recognize the presence of listed species during activities associated with exploration would allow the employee to take measures to minimize disturbance and avoid unauthorized incidental take. To this end, the MMS should work with the Service to produce, and work with the industry, to disseminate wallet-size information cards to company and contract employees. Dissemination of cards would preferably occur at employee orientations required in Stipulation 2 of the Lease Sale 186 EIS. These cards could provide information on identifying eiders and distinguishing among eider species as well as contact information for observations relevant to conservation.
3. The oil spill contingency plans for exploration and delineation wells drilled as a result of Lease Sale 186 should include measures and the capability to deploy at least 10 *Breco* buoys (or other similar devices, to be approved by the Service) to haze or scare seaducks from oiled

areas in the event of a marine spill. The spill plans should require that spill response personnel are knowledgeable of the location of available hazing devices and trained in their use.

4. To minimize disturbance of nesting, brood-rearing, and migrating spectacled and Steller's eiders with aircraft, the MMS should work with the Service to cooperatively develop project-specific aircraft flight route strategies for exploration and delineation drilling activities. Any decision regarding aircraft flight routes will comply with all appropriate Federal Aviation Administration (FAA) rules, regulations and policies. This recommendation does not apply to aviation activities conducted when eiders are not present (October 31- May 1).

Additional conservation recommendations may be proposed during subsequent incremental steps of this lease sale. In order for the Service to be kept informed of actions minimizing or avoiding adverse effects or benefitting listed species or their habitats, the Service requests notification of the implementation of any conservation recommendations.

REINITIATION NOTICE

This concludes formal consultation on the actions outlined in the MMS's letter received May 29, 2002. 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 agency that may affect listed species or critical habitat in a manner or to an extent not considered in this opinion; 3) the agency action is subsequently modified in a manner that causes an effect to listed or critical habitat not considered in this opinion; or 4) a new species is listed or critical habitat designated that may be affected by the action. In instances where the amount or extent of incidental take is exceeded, any operations causing such take must cease pending reinitiation.

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

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ATTACHMENT 1

OCS Oil and Gas Lease Sale 186, Beaufort Sea
Consultation History

- 05/09/02 - MMS requests formal consultation from Service (Washington D.C. Office) for Lease Sale 186, and transmits Biological Evaluation.
- 05/22/02 - Service (FFWFO staff) and MMS meet to discuss initiating formal consultation Lease Sale 186.
- 05/23/02 - MMS transmits maps to Service comparing Beaufort Sea Lease Sales 144, 170 and proposed Lease Sale 186.
- 05/29/02 - The Service's Fairbanks Fish and Wildlife Office (FFWFO) receives MMS's Draft Lease Sale 186 EIS. Service begins reviewing it for completeness.
- 06/17/02 - Service Washington D.C. Office transmits acknowledgment of receipt of request for formal consultation and agrees to prepare draft Biological Opinion (BO).
- 07/10/02 - FFWFO receives MMS's completed/bound Draft Lease Sale 186 EIS and accompanying CD-ROM.
- 09/06/02 - Service and MMS discuss further information needs, potential delivery date for draft BO, and what the Service anticipate including as "Terms and Conditions."
- 09/10/02 - Service and MMS discuss uncertainties over quantifying number, location, and operational lifetime of potential exploratory and production drilling. Also discuss time lines and potential "Terms and Conditions."
- 09/11/02 - Service and MMS discuss BO. MMS stated their desire to get a BO by the end of the comment period on the EIS (9/20) so they could finalize the EIS. The Service explained their understanding of the time line and their desire to complete the BO on time.
- 09/17/02 - Service requests that MMS generate language that provides more refined estimates of total exploration/production activity that will result from Lease Sale 186 (include methodology for estimating number of wells and longevity of operation).

- 09/17/02 - MMS asks the Service to use their estimates of exploration/delineation activity in the EIS to generate incidental take. The Service explained to them that we can proceed but we would like them to send us something in writing explaining whether their exploration/production numbers in the EIS represent an average or maximum scenario.
- 09/18/02 - MMS and the Service meet to discuss due dates and scope of Lease Sale 186 BO. MMS stated that the exploration and development scenarios described in the Lease Sale 186 EIS were maximum estimates.
- 09/19/02 - Service tells MMS that the Service received MMS's request for consultation on May 29, 2002. Therefore, the 135-day clock for the Service issuing its BO terminates on October 10th not on September 21. The Service commits to providing MMS with a draft as soon as possible and prior to deadline.
- 09/19/02 - Service forwards MMS draft "Reasonable and Prudent Measures", "Terms and Conditions", and "Conservation Recommendations" sections from draft Lease Sale 186 BO.
- 09/27/02 - Service transmits draft BO to MMS.
- 10/02/02 - MMS and Service discuss MMS's comments on the Service's draft Lease Sale 186 BO. The Service agrees to consider MMS's comment and get them a revised draft BO by Monday at 5:00 p.m..
- 10/07/02 - Service transmits revised draft BO via email to MMS.
- 10/10/02 - MMS transmits comments on revised draft BO via email. MMS states that if their changes are acceptable to the Service, another meeting to further discuss the draft BO is not necessary.
- 10/17/02 - Service makes changes to draft Biological Opinion and transmits it back to MMS via email.
- 10/18/02 - MMS transmits comments on revised draft BO via email.
- 10/18/02 - Service and MMS discuss MMS's comments and agree to language for final BO.