



United States Department of the Interior
U.S. FISH AND WILDLIFE SERVICE
Fairbanks Fish and Wildlife Field Office
101 12th Avenue, Room 110
Fairbanks, Alaska 99701
April 25, 2014



MEMORANDUM

To: Acting USFWS Regional Endangered Species Coordinator

From: Ted Swem, USFWS Endangered Species Branch Chief *Ted Swem*

Subject: Intra-Service Biological Opinion for USFWS issuance of a Section 10 permit to ABR, Inc. for studies on the North Slope

This memo transmits the U.S. Fish and Wildlife Service's (Service) Biological Opinion (BO) on the issuance of a Section 10 permit under the Endangered Species Act for ABR, Inc.'s ongoing survey work across the North Slope for spectacled and Steller's eiders. The purpose of the permitted studies is to increase our understanding of the range and distribution of these species. This BO describes the effects of these actions on threatened Steller's (*Polysticta stelleri*) and spectacled (*Somateria fischeri*) eiders, and polar bears (*Ursus maritimus*), pursuant to section 7 of the Endangered Species Act (ESA) of 1973, as amended (16 U.S.C. 1531 et seq.).

Based on the information provided on the proposed 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 proposed action will violate section 7(a)(2) of the Act. Section 7(a)(2) of the Act states that Federal agencies must ensure that their activities are not likely to jeopardize the continued existence of any listed species, or result in the destruction or adverse modification of designated critical habitat.

The incidental take statement for this non-jeopardy BO includes reasonable and prudent measures and terms and conditions that are mandatory for ABR, Inc. to implement.

A complete 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 BO, please contact Ted Swem, Endangered Species Branch Chief, at (907) 456-0441.



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Based on the information provided on the proposed 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 proposed action will violate section 7(a)(2) of the Act. Section 7(a)(2) of the Act states that Federal agencies must ensure that their activities are not likely to jeopardize the continued existence of any listed species, or result in the destruction or adverse modification of designated critical habitat.

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INTRA-SERVICE BIOLOGICAL OPINION

for

**U.S. Fish & Wildlife Service's Issuance of a
Section 10 Permit to ABR, Inc.**

for

**Studies on the North Slope Involving
Spectacled and Steller's eiders**

April 2014

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INTRODUCTION

This document is the U.S. Fish and Wildlife Service's (Service) Biological Opinion (BO) on the issuance of a Section 10 permit under the Endangered Species Act for ABR, Inc.'s on-going survey work across the North Slope for spectacled and Steller's eiders. The purpose of the permitted studies is to increase our understanding of the range and distribution of these species. Little is known about nesting behavior in relation to disturbance from construction and oil field activities. As oil field development expands into new areas within the range of these listed species it is important to have data to inform management decisions.

This BO describes the effects of these actions on threatened spectacled (*Somateria fischeri*) and Steller's (*Polysticta stelleri*) eiders, and polar bears (*Ursus maritimus*) and polar bear critical habitat pursuant to section 7 of the Endangered Species Act (Act) of 1973, as amended (16 U.S.C. 1531 et seq.). Project details were received on 13 April 2012. Formal consultation began on 17 April 2014.

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

- Jeopardize the continued existence of listed species.

The Service has determined the Proposed Action may affect but is not likely to adversely affect polar bears or Steller's eiders and is likely to adversely affect spectacled eiders. After reviewing the status and environmental baseline of spectacled eiders and analysis of the potential effects of the Proposed Action to them, the Service concludes the Proposed Action is not likely to jeopardize the continued existence of spectacled eiders.

If you have comments or concerns regarding this BO, please contact Ted Swem, Endangered Species Branch Chief, Fairbanks Fish and Wildlife Field Office at (907) 456-0441.

DESCRIPTION OF THE PROPOSED ACTION

Section 7(a)(2) of Act 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 Region 7 Fisheries and Ecological Services Office (Endangered Species Program) of the U.S. Fish and Wildlife Service. This office is issuing a section 10 permit to ABR Inc. for survey work

across the North Slope. The permit issuance is the federal nexus for consultation. This consultation is being conducted as an intra-service consultation with the Endangered Species Branch of the Fairbanks Fish and Wildlife Field Office.

Action Area

The action area is that area in which the direct and indirect effects of the proposed action may occur. The proposed studies will take place in a number of discrete geographic areas on the North Slope:

- Kuparuk Oilfields, including the Kuparuk Rolligon Trail;
- Colville River Delta - ground-based survey work will concentrate around the CD-3 and CD-5 developments;
- National Petroleum Reserve – Alaska - study areas are west of Alpine and Nuiqsut and north to the Beaufort Sea coast in the Fish Creek delta area; and
- Barrow - Aerial surveys in USGS Quads Barrow and Meade River from Ikpikpuk River to Peard Bay, south to Meade River.

Project Action

This BO describes and evaluates four groups of actions that will occur as a result of the proposed project:

- Nest searching surveys for spectacled and Steller's eiders;
- Road-based pre-nesting surveys for spectacled and Steller's eiders; and
- Aerial surveys (fixed-wing) for spectacled eiders and Steller's eiders.

Kuparuk Rolligon Trail—ABR proposes to conduct one aerial survey for spectacled and Steller's eiders along the rolligon trail from DS2L in Kuparuk to the ASRC mine site on the Colville River, where work related to rehabilitating tundra damage will occur. ABR will fly a survey patterned after the Alpine Pipeline survey. The survey will be with a fixed-wing aircraft (C-185) at 50 m agl, speeds ~90 knots, and cover 0.25 mi on either side of the length of the rolligon trail. Although birds sometimes flush during these surveys, researchers have observed that they generally circle and land again (duration less than 1 minute). The survey plane moves quickly through the area and the disturbance is a single, transitory event. Also proposed is to nest search for spectacled and Steller's eiders nests in areas where helicopters will land to survey possible rehabilitation sites. Approximately 7 to 12 landing sites may need nest searches. At each site, 2-4 biologists on foot would search a 200 m radius around each landing site. If spectacled or Steller's eider nests are found, the location will be reported to ConocoPhillips so that the nest sites can be avoided until after the nesting season.

Kuparuk Oilfield—Continuation of annual aerial and ground pre-nesting and nesting surveys for Spectacled Eiders in the oilfield. Road surveys will be conducted between approximately 5–16 June, and aerial surveys during ~8–15 June. Field crews also will search for Spectacled Eider nests at selected ground locations based on observations of pre-nesting pairs, and at previous years' nesting areas. Field crews will collect down and contour feathers to aid in species identification and for possible future genetic analyses. ABR will place up to 3 digital video cameras to monitor spectacled eider nests and insert up to 6 thermistored eggs in spectacled eider nests to monitor incubation constancy.

Cameras are equipped with memory cards that will not need to be collected until the nest-fate checks in early July, which eliminates disturbance of nesting eiders after the initial installation. Thermistors also do not need to be checked until after nests hatch.

Aerial surveys will be with a fixed-wing aircraft (C-185) at 50 m agl, speeds ~90 knots, and along east-west transects spaced 0.5 miles apart, except for one discrete survey that covers 0.25 mi on either side of the length of the Alpine Pipeline from Kuparuk's CPF2 to Alpine's CD1. The survey plane moves quickly through the area and the disturbance is a single, transitory event.

Colville River Delta—Continuation of annual aerial surveys for pre-nesting Spectacled Eiders and Steller's Eiders, approximately 8–15 June. Ground-based searches for spectacled eider nests will be conducted within 200 m of the CD-3 footprint, at Alaska Clean Seas (ACS) equipment deployment sites, 3 bridge crossings, along the ice-road from Alpine to CD-3, and other miscellaneous locations as needed. Nest searches are scheduled for ~20 June to 5 July to find all active and inactive eider nests prior to off-pad activities by clean-up, survey, and ACS crews at these sites. CPAI environmental staff will be informed of any spectacled eider nest locations so that active nest sites can be avoided by oilfield workers. Active spectacled eider nests will be recorded. For those that are inadvertently flushed, eggs will be floated, and temperature-sensing eggs to monitor incubation will be placed in nests. The data loggers will be retrieved in mid-July after nesting is complete.

Aerial surveys will be conducted with a fixed-wing aircraft (C-185) at 50 m agl, speeds ~90 knots, and along east-west transects spaced 0.25 miles apart. The survey plane moves quickly through the area and the disturbance is a single, transitory event.

National Petroleum Reserve—Alaska (NPR–A)—ABR will conduct an aerial survey on approximately 8–15 June for pre-nesting spectacled and Steller's eiders in the NPR–A in a study area west of Alpine and Nuiqsut and north to the Beaufort Sea coast west to the western edge of the Fish Creek Delta, then south to include a block of area around the new CD5 pad and proposed GMT-1 and GMT-2 drill pads. Surveys will be with a fixed-wing aircraft (C-185) at 50 m agl, speeds ~90 knots, and along east-west transects spaced 0.5 miles apart. The survey plane moves quickly through the area and the disturbance is a single, transitory event.

CD5 Project—The goal of this study is to investigate potential effects of the proposed CD-5 development on the habitat use, distribution, and nest survival of greater white-fronted geese (GWFG) in an area that also supports nesting by spectacled eiders. CD-5 is the first oil and gas development proposed in the NE NPRA and will be connected by an all-season road and bridges to the Alpine oilfield on the Colville Delta near CD-4. Because the GWFG is a valued subsistence resource and abundant in the CD-5 area, ABR will use GWFG as a study species for the effects of habitat modification and disturbance from CD-5; spectacled eider and king eider nests will be recorded as well. Nest searches will be conducted in ~80 10-ha plots stratified by habitat around the proposed CD-5 project on the Colville River Delta during 10–20 June. The plots will be

distributed in test and reference areas on the river flood plain, and along the road and drill site location off the flood plain. Plots will be permanently located by coordinates at corner points and relocated in the field with handheld GPSs that will display plot boundaries. Although the focus of the study is on GWFG, there is the potential for the disturbance of spectacled eiders as field crews conduct ground-based nest searches.

Barrow Area—ABR will conduct aerial surveys for eiders (primarily for Steller's Eiders, but spectacled eiders will also be recorded) near Barrow (USGS quads Barrow, Teshekpuk, and Meade River) from Ikpikpuk River to Peard Bay, south to Meade River during June 2014 for the USFWS/BLM/NSB. Some wetland areas between the Meade River and Atqasuk may be surveyed off transect. These surveys will be with a fixed-wing aircraft (C-185) at 50 m agl, speeds ~90 knots, and along east-west transects spaced 0.5 miles apart. The survey plane moves quickly through the area and the disturbance is a single, transitory event.

Effects Determination for Polar Bears

Polar bears are widely distributed throughout the Arctic where the sea is ice-covered for large portions of the year. Sea ice provides a platform for hunting, feeding, breeding, denning, resting, and long-distance movement. Polar bears primarily hunt ringed seals, which also depend on sea ice for their survival, but they also consume other marine mammals (USFWS 2008a). Female polar bears excavate maternal dens in snow drifts in areas with suitable topographic relief in terrestrial habitats as well as on pack ice. While dens do occur in the region, there are no historic observations within the Action Area and females will not be denning during the period in which field studies will occur. In Alaska, non-denning polar bears usually occur on sea ice, but may occupy onshore habitats during the open-water period in late summer and early fall (reviewed in Schliebe et al. 2008). Thus, non-denning bears may occasionally travel through the Action Area. We expect most transient bears would move quickly through the area to a less disturbed location with minimal disruption of their normal behavior patterns; however, potential encounters with polar bears in the project area could result in harassment, injury, or killing of bears and pose a risk to human safety. Field crews will follow the Polar Bear Interaction Guidelines (Appendix A) to reduce potential adverse effects to polar bears associated with negative polar bear-human interactions by managing food and other wastes that may attract bears to the project site and supporting early detection and appropriate responses by field personnel if polar bears do enter the area.

The Service has determined effects to denning polar bears would not occur based on project timing and effects to non-denning bears would be insignificant because transient polar bears are likely to experience only minor and short-lived effects associated with disturbance from field crews and minimization measures are in place to reduce further potential adverse effects should a polar bear enter the oilfields. Accordingly, we have determined the Proposed Action is not likely to adversely affect polar bears.

Effects Determination for Alaska-breeding Steller's Eiders

In Alaska, Steller's eiders breed almost exclusively on the Arctic Coastal Plain (ACP), migrating to the breeding grounds in late spring and remaining in the region as late as

mid-October. However, nesting is concentrated in tundra wetlands near Barrow, AK and Steller's eiders occur at very low densities elsewhere on the ACP (Larned et al. 2010). USFWS aerial surveys for breeding eiders conducted on the ACP from 1992–2010 detected only 5 Steller's eiders east of the Colville River, with the most recent observation in 1998 (USFWS Alaska Region Migratory Bird Management, unpublished data).

Because available data indicate Steller's eiders are unlikely to nest near or migrate through the Action Area, we have determined that impacts to the species will either be insignificant (e.g., only minor disturbance from aerial surveys near Barrow) or so unlikely to occur as to be discountable. Thus, the Proposed Action is not likely to adversely affect Steller's eiders.

EFFECTS OF THE ACTION ON SPECTACLED EIDERS

Because we determined that activities permitted under the section 10 permit are likely to adversely affect spectacled eiders, we present information necessary for a biological opinion for this species below.

Status of Spectacled Eiders

Please see USFWS (2013) for the current status of spectacled eiders.

Environmental Baseline of Spectacled Eiders

The environmental baseline is the current status of listed species and their habitats, and critical habitat, as a result of past and ongoing human and natural factors in the area of the proposed action. Also included in the environmental baseline are the anticipated impacts of other proposed Federal projects in the action area that have already undergone formal section 7 consultation.

Spectacled eiders are present in the Action Area from late May through September. Spectacled eiders arrive in the Action Area in late May to early June, nest initiation begins mid June, incubation begins in mid to late June, and hatch occurs in early to mid July. Young fledge approximately 50 to 55 days after hatch, and females with broods move from freshwater to marine habitats just prior to or after fledging (Safine 2011). Factors that may have contributed to the current status of spectacled are discussed below and include but are not limited to toxic contamination of habitat, increase in predation, subsistence harvest, and habitat loss through development and disturbance.

Toxic Contamination of Habitat

The primary known contaminant threat to spectacled eiders in the Action Area is ingestion of spent lead shot that has been deposited in tundra wetlands or nearshore marine waters used for foraging. The effect of exposure varies but both lethal and sublethal responses can occur (Hoffman 1990). Lead is likely available to eiders, particularly breeding hens and ducklings, that feed in areas used for hunting on the ACP, especially in shallow freshwater wetlands near villages. Blood samples from hens

breeding near Barrow in 1999 showed that all (7 of 7) had been exposed to lead (indicated by > 0.2 ppm lead in blood) and one had experienced lead poisoning (> 0.6 ppm). Lead isotope analysis confirmed the lead in these samples originated from lead shot rather than other potential environmental sources (Trust et al. 1997, Matz et al. 2004). Use of lead shot for hunting waterfowl is prohibited statewide, and its use for hunting all birds is specifically prohibited on the North Slope. Collaborative efforts to reduce use of lead shot appear to be effecting improvement; and, indices of use, which include monitoring the availability of lead shot in stores and spent shell casings at popular hunting sites, suggest that the use of lead shot has been greatly reduced and continues to decline on the North Slope (and elsewhere in the state).

Increased Predator Populations

Predator and scavenger populations may be increasing on the North Slope near sites of human habitation such as villages and industrial infrastructure (Eberhardt et al. 1983, Day 1998, Powell and Bakensto 2009). Reduced fox trapping, anthropogenic food sources in villages and oil fields, and nesting/denning sites on human-built structures may have resulted in increased fox, gull, and raven numbers (Day 1998, USFWS 2003). These anthropogenic influences on predator populations and predation rates may have affected eider populations, but this has not been substantiated. Steller's eider studies at Barrow attributed poor breeding success to high predation rates (Obritschkewitsch et al. 2001). In years when arctic fox removal was conducted at Barrow prior to and during Steller's eider nesting, nest success appears to have increased substantially (Safine 2012), reinforcing that nest depredation may be a significant population-level influence.

Subsistence Harvest

Prior to the listing of spectacled eiders under the ESA, some level of subsistence harvest of these species occurred across the North Slope (Braund et al. 1993). Hunting for spectacled eiders was closed in 1991 by Alaska State regulations and Service policy, and outreach efforts have been conducted by the North Slope Borough, BLM, and Service to encourage compliance. Harvest surveys indicate that listed eiders are taken during subsistence hunting on the North Slope, although estimates of the number taken are imprecise, and numerous unquantifiable biases compromise the reliability of estimates. Continued efforts to eliminate shooting are being implemented in North Slope villages. Intra-service consultations for the Migratory Bird Subsistence Hunting Regulations are conducted annually.

Impacts from Development and Disturbance

With the exception of contamination by lead shot, destruction or modification of North Slope nesting habitat of listed eiders has been limited to date, and is not thought to have played a major role in population declines of spectacled eiders. While development activities may adversely affect listed eiders, these species were not listed as a result of the impacts of development. The majority of eider breeding habitat on the ACP remains unaltered by humans, although limited portions of each species' breeding habitat have been impacted by fill of wetlands, the presence of infrastructure that presents collision risk, and other human activities that may cause disturbance of birds or increase populations of nest predators. These impacts have resulted from the gradual expansion of

communities, limited military facilities such as the Distant Early Warning (DEW) Line sites at Cape Lonely and Cape Simpson, and, more recently, oil development since construction of the Prudhoe Bay field and TAPS in the 1970s.

Oil development is gradually spreading from the original hub at Prudhoe Bay. Given the expansion of the Alpine field, development is likely to continue to spread west.

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.

Scientific, field-based research is also increasing on the ACP as interest in climate change and its effects on high latitude areas continues. While many of these activities have no impacts on listed eiders as they occur in seasons when eiders are absent from the area, or use remote sensing tools, on-the-ground activities and tundra aircraft landings likely disturb a small number of listed eiders each year. Many of these activities are considered in intra-Service consultations or under a programmatic consultation with federal agencies.

Federal Actions

In the final jeopardy analysis of this biological opinion, we considered recent activities across the North Slope that required formal section 7 consultation. Take estimates mostly fall into the categories of collision, disturbance, and habitat loss, although some research projects involve direct take of adults or eggs (mostly nonlethal) by capture/handling during research. Incidental take is estimated prior to the implementation of reasonable and prudent measures and associated terms and conditions which serve to reduce the levels of incidental take. Further, in some cases, estimated take is likely to occur over the life of the project (often 30–50 years) rather than annually or during single years reducing the severity of the impact to the population. There are also important differences in the type of incidental take. The majority of estimated incidental take is potential loss of eggs/ducklings, which would have a much lower affect upon survival and recovery of the species than death of adults. For example, spectacled eider nest success recorded on the Y-K Delta ranged from 18-73% (Grand and Flint 1997), and average clutch size was 5 eggs (Petersen et al. 1999). From the nests that survived to hatch, spectacled eider duckling survival to 30-days ranged from 25-47% on the Y-K Delta (Flint et al. 2000). Over-winter survival of one-year old spectacled eiders was estimated at 25% (P. Flint pers. comm.), with annual adult survival of 2-year old birds (that may enter the breeding population) of 80% (Grand et al. 1998). Combining these intervals, we estimate for every 100 spectacled eider nests on the Y-K Delta, only 2 - 17 females would be

expected to survive and enter (recruit) into the breeding population. We would expect a similarly low proportion of eggs on the North Slope to survive to recruit into the breeding population.

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 2006a). 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 2006a), 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.

Effects of the Action on Spectacled Eiders

This section of the biological opinion provides an analysis of the effects of the Action on listed species, and on critical habitat. Both direct effects (those immediately attributable to the Action), and indirect effects (those caused by the Action, but which will occur later in time, and are reasonably certain to occur) are considered. Finally, the effects from interrelated and interdependent activities are also considered. These effects will then be added to the environmental baseline in determining the proposed Action's effects to the species or its critical habitat (50 CFR Part 402.02).

Beneficial effects

Beneficial effects are those effects of an action that are wholly positive, without any adverse effects, on a listed species or designated critical habitat. This project will have beneficial effects for the species, in that it will provide the Service and Eider Recovery Team with information that will better enable us to develop management actions to aid recovery.

Direct Effects

Issuance of the section 10 permit would allow activities that may affect both listed eider species through disturbance. The proposed field activities will not occur within critical habitat; thus we conclude that the proposed activity will not adversely modify or destroy critical habitat.

Ground-based Surveys

Ground-based surveys for spectacled eiders will occur at the Kuparuk Oilfield, the Colville River Delta, and at CD5. It is generally recognized among researchers that investigator disturbance can have a negative impact on waterfowl breeding success. During the pre-nesting period, courting activities and foraging efficiency and feeding times could be impacted. During the nesting period, females may be flushed from nests, resulting in exposure of 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).

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 more likely to depredate nests following 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 some predators, such as 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 the action area.

In his review paper, Götmark (1992) concluded 76% of papers that showed decreased nest success as a result of disturbance attributed the reduction to predation and 34% to nest desertion. 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. Data from the Y-K Delta indicates reductions in the daily spectacled eider nest survival rate of 4% (Bowman and Stehn 2003), and 14% (Grand and Flint 1997) due to disturbance.

Aerial Surveys

Fixed-wing aerial surveys will be conducted to locate possible breeding pairs of spectacled and Steller's eiders in the Kuparuk Oilfield, on the Colville River Delta, in the NPRA, and in the Barrow area. Although birds sometimes flush during these surveys, they generally circle and land again (duration less than 1 minute). The survey plane moves quickly through the area and the disturbance is a single, transitory event. Additionally, although difficult to quantify, it is reasonable to assume that birds in the direct flight path are more likely to flush than those farther away from the aircraft. Given that observers are recording observations at 200m on each side of the aircraft and that the majority of surveys are flown with transects spaced 800m apart (50% coverage) or 1600m apart (25% coverage), we presume that only a proportion of the total listed eiders in the survey area may be disturbed. Disturbance of non-nesting birds is unlikely to result in harassment or harm as defined by the ESA, whereas disturbance to incubating females may increase risk of nest abandonment or depredation. However, surveys are timed to occur at the pre-nesting stage, when only a small number of females will be incubating. In the unlikely event that an incubating female is flushed, the transitory nature of the disturbance presumably would not preclude the female's timely return to the nest. Therefore, given that: 1) surveys are transitory and will likely disturb listed eiders for a short period of time, after which they will resume normal behavior; 2) surveys are not expected to disturb all listed eiders in survey area; and 3) few if any incubating females will be disturbed, it is unlikely that disturbance from fixed wing aerial surveys will adversely affect listed eiders.

Effects in the Study Areas

Kuparuk Rolligon Trail—Because the rolligon trail is south of where spectacled eiders are normally found (Steller's eiders are not found in this area), we estimate that no more than 2 spectacled eider nests may be disturbed during this aerial survey. Disturbance is

expected to be minor and temporary because the survey plane moves quickly through the area and the disturbance is a single, transitory event.

Kuparuk Oilfield—We estimate that fewer than 20 spectacled eider nests would be disturbed in the process of nest searching and/or installing cameras or thermistored eggs.

Although birds sometimes flush during these aerial surveys, ABR has previously observed that they generally circle and land again (duration less than 1 minute). The survey plane moves quickly through the area and the disturbance is a single, transitory event. Thus, we expect effects of disturbance to be minor and temporary.

Colville River Delta—We expect that no more than 10 nests of spectacled eiders will be disturbed during nest search surveys.

Although birds sometimes flush during these aerial surveys, ABR has observed that eiders generally circle and land again (duration less than 1 minute). Disturbance is expected to be minor and temporary because the survey plane moves quickly through the area and the disturbance is a single, transitory event.

National Petroleum Reserve- Alaska -- Although birds sometimes flush during these aerial surveys, ABR has observed that eiders generally circle and land again (duration less than 1 minute). Disturbance is expected to be minor and temporary because the survey plane moves quickly through the area and the disturbance is a single, transitory event.

CD5 Project—We expect that no more than 3 spectacled eider nests might be encountered and potentially disturbed (none were found in 2013; ABR 2014) during goose surveys. If an eider nest is found, field crews will record the location and status of the nest (i.e., active or failed). If a hen is inadvertently flushed from a nest, field crews will record the number of eggs, float the eggs to determine the age of the nest, and cover the nest with nest material and vegetation to camouflage it from predators.

Barrow Area— Although birds sometimes flush during these aerial surveys, ABR has observed that eiders generally circle and land again (duration less than 1 minute). Disturbance is expected to be minor and temporary because the survey plane moves quickly through the area and the disturbance is a single, transitory event.

Summary – We estimate these studies may disturb up to 33 spectacled eider nests during nest surveys (20 in Kuparuk + 10 on the Collville River Delta + 3 in CD5 area = 33 nest disturbances). We expect that aerial disturbances will be minor and temporary.

Potential for Egg Loss or Nest Abandonment

While the potential for eider egg loss or nest abandonment is low from nest searching and monitoring, it is not negligible. For the purposes of this BO, we are considering nest searches and placement of thermistored eggs to create the same probability of nest failure. However, not all flushes will result in a nest being abandoned or depredated.

Data from the Y-K Delta indicate a possible reduction in spectacled eider nest survival of due to observer disturbance (Grand and Flint 1997). A nest study on common eiders in on the North Slope indicated observers decreased nest survival by 9-15% (Bentzen et al. 2008). In these studies, nests were visited multiple times by observers. ABR field crews would only visit nests once; thus, ABR field crews would likely have a much smaller effect on nest survival than the above studies. For the purposes of estimating incidental take in this BO, we use our best professional judgment and presume an observer-caused nest failure rate of 5%. Hence, the predicted 33 single spectacled eider flush events will result in the loss of up to 2 nests ($33 \text{ nests} \times 0.05 = 1.65 \text{ nests}$). 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, incidental take resulting from ground-based nest searches may be up to $3.9 \text{ eggs} \times 2 \text{ nests} = 8 \text{ eggs}$ (7.8 rounded up).

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 activities that may be authorized could lead to additional research in the future, they cannot be said to be reasonably expected to occur. Therefore, no indirect effects to listed eiders are anticipated to result from the proposed activities.

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 issuance of the proposed permit or activities authorized by it that could result in impacts to listed eiders.

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.

CONCLUSION

After reviewing the current status of spectacled and Steller’s eiders and polar bears, the environmental baseline, effects of the proposed activities, and cumulative effects, it is the Service’s biological opinion that the issuance of a section 10 permit to authorize the proposed activities is not likely to jeopardize the continued existence of spectacled and Steller’s eiders, and polar bears and is not likely to result in destruction or adverse modification of designated critical habitat.

The regulations (51 FR 19958) that implement section 7(a)(2) of the Act define "jeopardize the continued existence of" as, "to engage in an action that reasonably would be expected, directly or indirectly, to reduce appreciably the likelihood of both the survival and recovery of a listed species in the wild by reducing the reproduction, numbers, or distribution of that species." We have concluded that the proposed action is not likely to jeopardize the continued existence of spectacled and Steller's eiders, and polar bears or adversely modify or destroy its critical habitat.

The following information led us to the conclusion that this action, as proposed, is not likely to jeopardize the continued existence of these species:

- 1) Disturbance to breeding and nesting birds will occur, however, it will affect comparatively few individuals, and be minor in nature, and should be offset by the net benefit of the research to recovery of the species.
- 2) Disturbance to the listed population of Steller's and spectacled eiders from aerial surveys is anticipated to be transitory and will likely disturb listed eiders for a short period of time, after which they will resume normal behavior.
- 3) The project participants will abide by Polar Bear Interaction Guidelines (Appendix A) developed to ensure the permitted activities are conducted in a manner that avoids conflict between polar bears and humans. As a result of agreement to follow the guidelines, no adverse impacts to this species are anticipated.
- 4) Effects to critical habitat will not persist, will have at most an insignificant effect on the function of PCEs, and are unlikely to affect the intended conservation role for polar bears.

Using methods and logic explained in the *Effects of the Action* section, we estimate up to 8 spectacled eider eggs may be incidentally taken as a result of ground-based survey work.

Because only a small proportion of spectacled eider eggs or ducklings survives and is recruited into the breeding population, loss of eggs or ducklings is less significant to the population than the loss of breeding adults. Therefore, while the Service aims to minimize loss of all individuals in the population, losing an adult, especially a breeding female, negatively affects the population more than the loss of individuals that have not reached adult or breeding status. Further, take of eggs/ducklings is an estimate of take that may occur; actual take is likely much lower because we base take estimates on conservative assumptions. Thus, we expect the actual or realized take is most likely substantially lower. Additionally, in all cases reasonable and prudent measures and their implementing terms and conditions for each BO likely minimizes the estimated take.

Because the potential loss of eider recruitment is very small relative to the size of the North Slope breeding population¹, we believe the Proposed Action will not have significant population-level effects and will not affect the likelihood of survival and recovery of spectacled eiders. Accordingly, it is the Service's biological opinion that the Proposed Action is not likely to jeopardize the continued existence of spectacled eiders. This BO's determination of non-jeopardy is based on the assumption that ABR, Inc. will consult with the USFWS Endangered Species Program on any future activities related to the Proposed Action that are not evaluated in this document.

In addition to listed eiders and polar bears, the area affected by the Proposed Action may now or hereafter contain plants, animals, or their habitats determined to be threatened or endangered. The Service, through future consultation may recommend alternatives to future developments within the project area to prevent activity that will contribute to a need to list such a species or their habitat. The Service may require alternatives to proposed activity that is likely to result in jeopardy to the continued existence of a proposed or listed threatened or endangered species or result in the destruction or adverse modification of designated or proposed critical habitat. The Federal action agencies should not authorize any activity that may affect such species or critical habitat until it completes its obligations under applicable requirements of the ESA as amended (16 U.S.C. 1531 et seq.), including completion of any required procedure for conference or consultation.

INCIDENTAL TAKE STATEMENT

Section 9 of the Act and Federal regulations pursuant to section 4(d) of the Act prohibit the take of endangered and threatened species, respectively, without special exemption. Take is defined as to harass, harm, pursue, hunt, shoot, wound, kill, trap, capture or collect, or attempt to engage in any such conduct. "Harm" is further defined by the Service to include significant habitat modification or degradation that results in death or injury to listed species by significantly impairing essential behavioral patterns, including breeding, feeding, or sheltering. "Harass" is defined by the Service as intentional or negligent actions that create the likelihood of injury to listed species to such an extent as to significantly disrupt normal behavior patterns which include, but are not limited to, breeding, feeding or sheltering. Incidental take is defined as take that is incidental to, and not the purpose of, the carrying out of an otherwise lawful activity. Under the terms of section 7(b)(4) and section 7(o)(2), taking that is incidental to and not intended as part of the agency action is not considered a prohibited taking provided that such taking is in compliance with the terms and conditions of this Incidental Take Statement. In addition, because the proposed action is the issuance of permits per section 10(a)1(A) of the Act, direct take is permitted per the statute and implementing regulations.

¹ Applying the methods of Stehn et al. (2006) to more recent aerial survey data from the North Slope results in an estimate of 11,254 (8,338–14,167, 95% CI) for the period of 2007–2010.

The measures described below are non-discretionary, and must be undertaken by ABR, Inc., 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 Service has a continuing duty to regulate the activity covered by this Incidental Take Statement. If the Service fails to assume and implement the terms and conditions, the protective coverage of section 7(o)(2) may lapse. In order to monitor the impact of incidental take, the researchers 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)].

As described in the *Effects of the Action* section, the activities described and assessed in this BO may adversely affect spectacled eiders through investigator disturbance during ground-based surveys and nest searches. Most take associated with this project is not incidental, but permitted in the section 10 permit. However, incidental take could occur through unintentional nest abandonment resulting from nest surveys. Estimating take resulting from disturbance/nest abandonment by spectacled eiders from the proposed project activities is difficult, but information does exist from similar studies of spectacled eiders and other waterfowl, using similar techniques. Methods used to estimate incidental take for each of these are described in the *Effects of the Action* section. *The Service estimates 8 spectacled eider eggs may be incidentally taken as a result of ground-based survey work.*

While the incidental take statement provided in this consultation satisfies the requirements of the Act, 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 specified herein.

REASONABLE AND PRUDENT MEASURES

Of the activities covered under the permit TE012155-0, only those associated with the ground-based surveys may result in incidental take. The Service believes that the following reasonable and prudent measure (RPM) is necessary and appropriate to minimize this incidental take of spectacled eiders:

1. To minimize the likelihood that nest investigation work will increase predation rates and reduce nesting and fledgling success of spectacled eiders, work shall be organized so that the minimum number of visits to a nest are performed.

TERMS AND CONDITIONS

In order to be exempt from the prohibitions of Section 9 of the Act, the following terms and conditions, which implement the reasonable and prudent measure described above applies. These terms and conditions are non-discretionary:

- (a) Prior to approaching nests, the surrounding area shall be visually checked for predators. If a predator is spotted in proximity (i.e., would be able to locate the nest through flushing of the hen), the nest shall not be approached. Predators, for the purposes of this term and condition, shall include fox, ravens, gulls, and jaegers.
- (b) Equipment (thermistored eggs) will be retrieved, and nest fate will be checked only after hatch.
- (c) Eggs shall be immediately covered with down or like insulating material following completion of nest/egg examination and thermistored egg addition.
- (d) A report for all activities conducted under authority of this permit must be submitted annually to the Endangered Species Coordinator, Regional Office, by December 31. The report shall include the following sections: introduction, objectives, methods, results, conclusions, and recommendation for species recovery.

The Service believes that no more than 16 spectacled eider eggs will be incidentally taken during activities permitted by TE012155. The RPM, with its implementing terms and conditions, 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 permittee (ABR, Inc.) 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 or spectacled eiders are encountered injured or killed as a result of permitted activities, please contact either the Fairbanks Fish and Wildlife Field Office, Endangered Species Branch, at (907) 456-0441, or the Anchorage Fish and Wildlife Field Office, Endangered Species Branch, at (907) 271-2778, 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. No conservation recommendations have been developed for this project.

REINITIATION NOTICE

This concludes formal consultation on the renewal of Recovery Permit # TE012155. 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 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.

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APPENDIX A

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 humans and polar bears. 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. The MMPA and ESA both prohibit the “take” of polar bears without authorization. Take includes disturbance/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 human-bear 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 Sarah Conn (907) 456-0499 of the Fairbanks Fish & Wildlife Field Office (FFWFO).

When operating aircraft:

- 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.

When traveling on land or water:

- 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. If this behavior is ignored, the polar bear may charge. Threatened animals may also retreat.
 - In rare instances you may encounter a *predatory* 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. Standing your ground, grouping together, shouting, and waving your hands may 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 using any deterrents available. If the attack is by a surprised female defending her cubs, remove yourself as a threat to the cubs.

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>.

FOR DEPARTMENT OF INTERIOR EMPLOYEES ONLY

Use of Deterrents

In addition to following the Guidelines above, all U.S. Fish and Wildlife Service (Service) employees must have completed the Department of the Interior’s (DOI) Bear and Firearm Safety Training course and be current in certification before engaging in field activities. Service staff must practice with and know how to use deterrents prior to conducting field work. If working in bear habitat, Service staff must anticipate and plan for possible scenarios of encountering polar bears, and identify appropriate responses, prior to initiating field work. Use of non-lethal polar bear deterrents by Service staff is only permissible if it is done in a humane manner and is for the purposes of protection or welfare of the bear or the public. Service staff has the right to use lethal methods to

protect the public from polar bears in defense of life situations, and may do so when all reasonable steps to avoid killing the bear(s) have been taken.

Notification of Use of Deterrents

The Department of the Interior Bear Incident Report Form will be used to record and report polar bear-human interactions *that require use of deterrents*. These incidents will be reported to the MMM Office. This information will be used to track interactions over time and improve polar bear conservation and management.