Appendix 10

Endangered and Threatened Species Consultation - Correspondence

APPENDIX 10. THREATENED AND ENDANGERED SPECIES CONSULTATION

United States Department of the Interior

BUREAU OF LAND MANAGEMENT
ALASKA STATE OFFICE
222 W. 7th Avenue, #13
ANCHORAGE, ALASKA 99513-7599

6843 (931)

JUN 10

Memorandum

To: Regional Director, U.S. Fish and Wildlife Service

From: State Director

Subject: Endangered Species - Proposed Oil and Gas Lease Sale in the National Petroleum Reserve-Alaska (NPR-A)

The Bureau of Land Management (BLM) published a Notice of Intent (attached) to prepare an Integrated Activity Plan/Environmental Impact Statement (IAP/EIS) for the northwestern portion of the National Petroleum Reserve-Alaska (NPRA). The IAP/EIS will update BLM's management strategy for this portion of NPRA (map attached), and will address a full range of management responsibilities within the planning area. The draft IAP/EIS is scheduled for publication in December 2002, with the final IAP/EIS released in the fall of 2003. The Record of Decision will be issued in November 2003. We are contacting you to begin early consultation for this planning effort in accordance with Section 7, Endangered Species Act of 1973, as amended (16 USC 1531 *et seq.*).

We request you provide us with a list of federally listed threatened, endangered or candidate species under the jurisdiction of your agency that could potentially be affected by human activities within the northwestern NPRA. Those specific authorized activities will be addressed during the development of the IAP/EIS, but may include oil and gas leasing, wildlife protection, subsistence and recreation.

In the most recent consultation with Fish and Wildlife Service (FWS), on the Trans Alaska Pipeline System permit renewal, FWS elected to address the effects of oil tankering on listed species and critical habitat through a separate consultation with the U.S. Coast Guard (USCG). This is in recognition of USCG's statutory authority relative to tankering activities. In addition, the National Marine Fisheries Services (NMFS) determined they would not be able to meaningfully measure, detect, or evaluate the effects associated with the transportation corridor. NMFS, therefore, considered these effects as discountable, and will not include them in the permit renewal consideration. We understand, like FWS, NMFS may elect to address the effects of oil tankering on listed species and critical habitat through a separate consultation with USCG.

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recognition of the Coast Guard's statutory authority over tankering activities. Accordingly, we do not plan to consult on listed species and critical habitat along the transportation corridor from Valdez to ports on the U.S. Pacific coast, and the Far East.

To facilitate the review, we have provided a copy of this letter to your Anchorage Field Office. BLM and Minerals Management Service (MMS) are in the process of developing alternatives and analyzing potential impacts of those alternatives at this time. BLM has been directed not to select a preferred alternative for the draft IAP/EIS. If you have questions concerning this proposed action, please contact Mr. Joel Hubbard of MMS at (907) 271-6670, or Mr. John Payne of my staff at (907) 271-3431.

We look forward to working with you and your staff in protecting and conserving endangered and threatened species.

Sincerely,

Linda S. C. Rundell
Acting State Director

Enclosures
1 - Notice of Intent (FR November 15, 2001) (5 pps)
2 - Northwest Planning Area Map (1 p)

cc:
NMFS, Anchorage Field Office
MMS, Anchorage Office

<PRE>
[Federal Register: November 15, 2001 (Volume 66, Number 221)]
[Notices]
[Page 57475-57476]
From the Federal Register Online via GPO Access [wais.access.gpo.gov]
[DOCID:fr15no01-81]

DEPARTMENT OF THE INTERIOR

Bureau of Land Management

[AK-930-1310-AG]

Notice of Intent To Prepare an Integrated Activity Plan IAP/ Environmental Impact Statement (EIS) on Management of the Northwestern Portion of the National Petroleum Reserve-Alaska (NPR-A); Request for Information; and Call for Nominations and Comments

AGENCY: Bureau of Land Management, Interior.

SUMMARY: In accordance with the Federal Land Policy and Management Act of 1976 (43 U.S.C. 1701 et seq.), as amended; the National Environmental Policy Act of 1969 (42 U.S.C. 4321 et seq.), as amended; Title I of the Naval Petroleum Reserves Production Act of 1976 (42 U.S.C. 6501 et seq.), as amended by the Department of the Interior and Related Agencies Appropriations Act for Fiscal Year 1981, Pub. L. 96-514, 94 Stat. 2957, 2964 (codified in 42 U.S.C. 6508); the Alaska National Interest Lands Conservation Act, Pub. L. 96-487, 94 Stat. 2371, section 810, 16 U.S.C. 3120; and the regulations at 43 CFR parts 2360 and 3130; the Bureau of Land Management (BLM), Alaska State Office, is preparing an Integrated Activity Plan (IAP)/Environmental Impact Statement (EIS) for the northwest portion of the National Petroleum Reserve-Alaska (NPR-A). This Notice also serves as a Request for Information (Request) and Call for Nominations (Call) and Comments per 43 CFR 3130.1 and 3131.2.

SUPPLEMENTARY INFORMATION: The purpose of this Notice is to invite suggestions and the submittal of relevant information for the proposed IAP/EIS. Potential issues include, but are not limited to, wildlife resources protection (terrestrial and aquatic); oil and gas leasing and development (pursuant to 43 CFR Part 3130); subsistence resources and activities and possible impacts on subsistence from various management

alternatives; access, recreation, and visual resources; threatened and endangered species; and historic; cultural, soil, water, and vegetation resources. Potential management actions and activities which may have environmental and subsistence impacts for the area include mineral material extraction; oil and gas exploration and development; wilderness; recreation; commercial development; recommendations for wilderness designations; modifications of existing Special Areas; and identification of any new areas for additional resource protection. Information, comments, and nominations on specific issues to be addressed in the plan are sought from all interested parties. This early planning and consultation step is important for ensuring that all interests and concerns are communicated to the Department of the Interior for future decisions in land use, planning, and management.

Description of the Area

The area subject to this Notice is composed of those BLM-administered lands, subject to valid existing rights, in the northwestern portion of NPR-A. The northwestern portion of NPR-A is described as: Beginning on the western boundary NPR-A on the east--west township line between T.8 N., R.40 W., and T.9 N., R.39 W., Umiat Meridan (UM.); Thence proceed easterly along the township line to the northeast corner of T.8 N., R.26 W., UM.; Thence proceed southerly along the township line to the southeast corner of T.7 N., R.26 W., UM.; Thence proceed easterly along the township line to the northeastern corner of T.6 N., R.25 W., UM.; Thence proceed southerly along the township line to the southeast corner of T.5 N., R.25 W., UM.; Thence proceed easterly along the township line to the northeast corner of T.4 N., R.24 W., UM.; Thence proceed southerly along the township line to the southeast corner of T.1 N., R.24 W., UM.; Thence proceed easterly along the township line to the northeast corner of T.1 S., R.24 W., UM.; Thence proceed southerly along the township line to the southeast corner of T.4 S., R.24 W., UM.; Thence proceed easterly along the township line to a point where the left bank of the Colville River meets the southern township line of T.4 S., R.15 W., UM.; Thence proceed in a generally easterly direction following the left bank of the Colville River to a point where the Colville River intercepts the eastern boundary of T.3 S., R.6 W., UM.; Thence proceed northerly following the township lines to the northeast corner of T.2 N., R.6 W., UM.; Thence proceed westerly following the township line to the right bank of the Ikpikpuk River on the south township line of T.3 N., R.12 W., UM.; Thence proceed northerly along the right bank of the Ikpikpuk River to the northern boundary of NPR-A; Thence follow the boundary of NPR-A in a general westerly and then southerly direction to the point of beginning of this description. This planning area consists of

approximately 9,980,000 acres of which approximately 9,437,000 are federal and approximately 543,000 acres are in private ownership. A large scale map of the plan area (which also serves as the Call map) showing boundaries of the area by township is available from the Alaska State Office, BLM, 222 West 7th Avenue, Anchorage, AK 99501, telephone (907) 271-5546.

Public Participation

BLM seeks information and comments on issues relating to the future land use, planning, and management of the northwest portion of NPR-A. Also requested is information and comments on resources, such as wilderness, wildlife and subsistence resources, as well as current and potential future activities on these lands, including possible development of the area's oil and gas potential. The agency is interested in learning what areas are of particular value for various species and uses, and what measures should be considered to protect resources and uses from potentially impacting activities. Comments are also sought on any potential conflicts with approved coastal management plans (CMPs) and other land use plans that may result from possible future activities in the area. These comments should identify specific policies of concern as listed in CMPs or other plans, the nature of the conflicts foreseen, and steps that BLM could take to avoid or mitigate the potential conflicts. Comments may be in terms of broad areas or focused on particular townships of concern. Comments are sought on activities and measures to protect surface resources within the plan area, including fish and wildlife, historical and scenic values. Comments are sought on subsistence uses and needs within the plan area and possible impacts on subsistence from other uses of the area. Comments should include recommendations for particular

[[Page 57476]]

sections of the plan area that are of value for surface and subsurface resources, as well as conditions, restrictions, and prohibitions that would protect surface resources. Comments, including names and street addresses of respondents, will be available for public review during regular business hours. Individual respondents may request confidentiality. If you wish to withhold your name or street address from public review or from disclosure under the Freedom of Information Act, you must state this prominently at the beginning of your written comment. Such requests will be honored to the extent allowed by law. All submissions from organizations and businesses, and from individuals identifying themselves as representatives or officials of organizations or businesses, will be available for public inspection in their

entirety.

Pursuant to 43 CFR 3131.1 and 3131.2, relevant information related to possible oil and gas leasing is requested for the plan area. Oil and gas companies are specifically requested to nominate areas within the plan area that they would like to have considered for oil and gas leasing. Nominations must be depicted on the Call map by outlining the area(s) of interest along township lines. Nominators are asked to submit a list of townships nominated to facilitate correct interpretation of their nominations on the Call map. Although the identities of those submitting nominations for oil and gas leasing become a matter of public record, the individual nominations will be held confidential consistent with applicable law. Nominators also are requested to rank townships nominated for oil and gas leasing according to priority of interest [(e.g., priority 1 (high), 2 (medium), or 3 (low)]. Townships nominated that do not indicate priorities will be considered priority 3. Nominators are encouraged to be specific in indicating townships by priority. Blanket priorities on large areas are not useful in the analysis of industry interest. The telephone number and name of a person to contact in the nominator's organization for additional information should be included in the response. The regulations at 43 CFR part 3130 limit the size of an oil and gas lease tract within the NPR-A boundaries to no more than 60,000 acres (43 CFR 3130.4-1). Although nominations are to be submitted along township lines, comments are also being sought on the preferred size of tracts for leasing in this area, not to exceed 60,000 acres.

Responses to this request for information and comments, and call for nominations must be received no later than 45 days following publication of this document in the Federal Register. Nominations must be submitted in envelopes labeled "Nominations Related to the NPR-A IAP/EIS" to protect the confidentiality of the nominations. The original Call map with nominations must be submitted to the NPR-A Planning Team Leader, Bureau of Land Management, 222 West 7th Avenue #13, Anchorage, AK 99513-7599. Information, comments, and nominations submitted in responses to this publication will assist in early scoping and later development of alternatives for the IAP/EIS and will help identify areas for potential activities, including oil and gas development and resource protection.

Tentative Schedule

Approximate dates for actions and decisions in the planning process for this proposal are:

Comments are due on Notice, Request, and Call--December 15, 2001.

Scoping meetings are scheduled for the following Alaska communities:

Point Lay--December 3, 2001
Anaktuvuk Pass--December 4, 2001
Wainwright--December 5, 2001
Atqasuk--December 6, 2001
Barrow--December 10, 2001
Nuiqsut--December 11, 2001
Fairbanks--January 15, 2002
Anchorage--January 16, 2002

All meetings will begin at 7:00 PM. Meeting locations will be announced later.

Draft IAP/EIS available for comment--November 19, 2002.
Public meetings/hearings--December, 2002--January, 2003.
Comments due on Draft IAP/EIS--January 30, 2003.
Final IAP/EIS available for public view--October 2, 2003.
Record of Decision--November 3, 2003.

FOR FURTHER INFORMATION CONTACT: Curt Wilson, (907) 271-5546 or <A HREF="mailto:clwilson@ak.blm.gov">clwilson@ak.blm.gov</A>. He can be reached by mail at 222 W. 7th Avenue,
#13, Anchorage, AK 99513-7599.

Francis R. Cherry, Jr.,
State Director, Alaska.
[FR Doc. 01-28665 Filed
11-14-01; 8:45 am]
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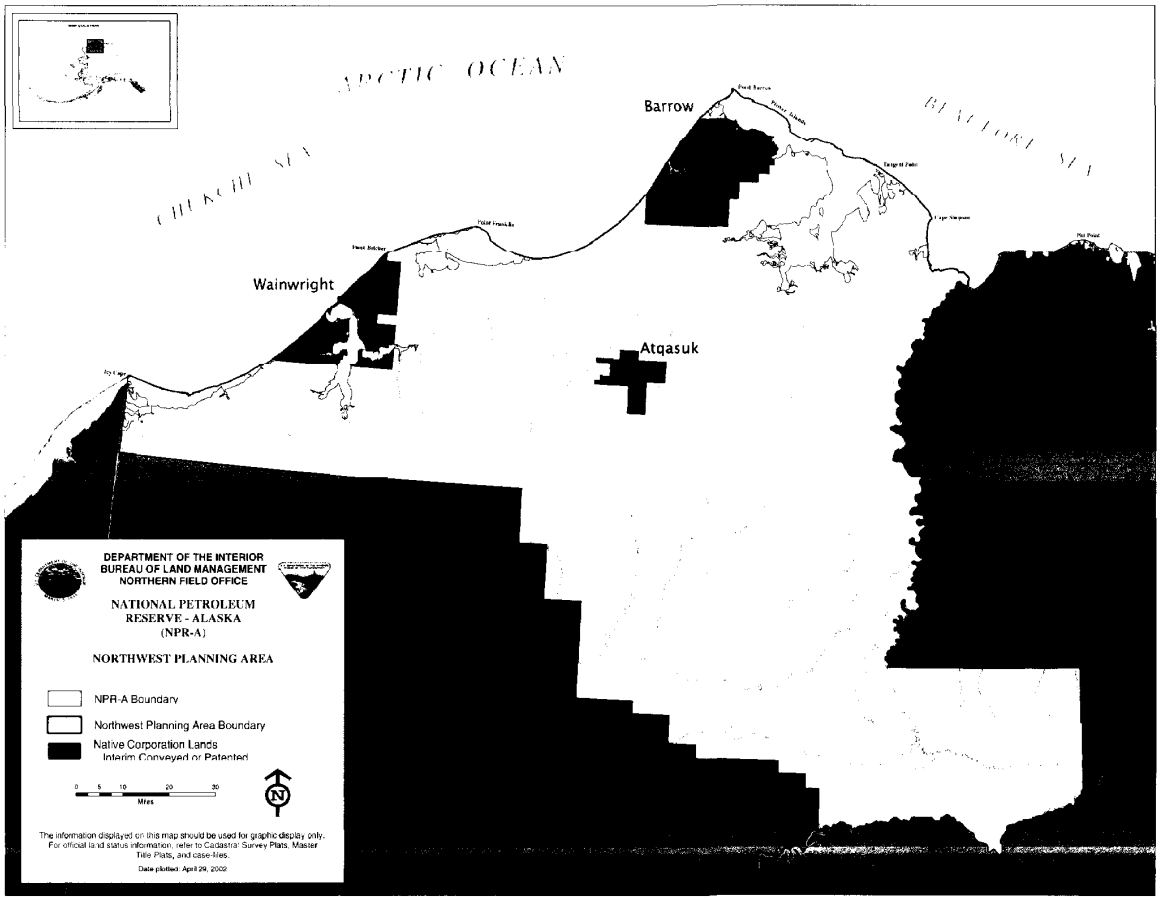
ARCTIC OCEAN
Barrow
Wainwright
Atqasuk
DEPARTMENT OF THE INTERIOR
BUREAU OF LAND MANAGEMENT
NORTHERN FIELD OFFICE
NATIONAL PETROLEUM
RESERVE - ALASKA
(NPR-A)
NORTHWEST PLANNING AREA
NPR-A Boundary
Northwest Planning Area Boundary
Native Corporation Lands
Interim Conveyed or Patented
0 5 10 20 30
Miles
N
The information displayed on this map should be used for graphic display only.
For official land status information, refer to Cadastral Survey Plats, Master
Title Plats, and case-files.
Date plotted: April 29, 2002

United States Department of the Interior

BUREAU OF LAND MANAGEMENT
ALASKA STATE OFFICE
222 W. 7th Avenue, #13
ANCHORAGE, ALASKA 99513-7599

6843 (931)

Mr. James Balsiger
Regional Administrator, Alaska Region
National Marine Fisheries Service
P.O. Box 21668
Juneau, Alaska 99802-1668

Dear Mr. Balsiger:

The U.S. Bureau of Land Management (BLM) published a Notice of Intent (attached) to prepare an Integrated Activity Plan/Environmental Impact Statement (IAP/EIS) for the northwestern portion of the National Petroleum Reserve-Alaska (NPRA). The IAP/EIS will update BLM's management strategy for this portion of NPRA (map attached), and will address a full range of management responsibilities within the planning area. The draft IAP/EIS is scheduled for publication in December 2002, with the final IAP/EIS released in the fall of 2003. The Record of Decision will be issued in November 2003. We are contacting you to begin early consultation for this planning effort in accordance with Section 7, Endangered Species Act of 1973, as amended (16 USC 1531 *et seq.*).

We request you provide us with a list of federally listed threatened, endangered or candidate species under the jurisdiction of your agency that could potentially be affected by human activities within the northwestern NPRA. Those specific authorized activities will be addressed during the development of the IAP/EIS, but may include oil and gas leasing, wildlife protection, subsistence and recreation.

In previous consultations with the National Marine Fisheries Service (NMFS), we consulted on listed species and critical habitat along transportation corridors from Valdez to ports in Washington, Oregon, and California, and the Far East. In the most recent Minerals Management Service Endangered Species Act, Section 7 consultations on the Liberty Development and Production Project and the proposed Beaufort Sea Planning Area Multiple Lease Sale (sales 186, 195, 202), as well as the Trans Alaska Pipeline System permit renewal, the NMFS determined they would not be able to meaningfully detect, measure, or evaluate the effects associated with transportation corridors. The NMFS, however, considered these effects as discountable, and did not include them in the biological opinion for the proposed action. In addition, we understand that the Fish and Wildlife Service and NMFS have elected to address the effects of oil-tankering on listed species and critical habitat in a separate consultation with the U.S. Coast Guard, in

recognition of the Coast Guard's statutory authority over tankering activities. Accordingly, we do not plan to consult on listed species and critical habitat along the transportation corridor from Valdez to ports on the U.S. Pacific coast, and the Far East.

To facilitate the review, we have provided a copy of this letter to your Anchorage Field Office. BLM and Minerals Management Service (MMS) are in the process of developing alternatives and analyzing potential impacts of those alternatives at this time. BLM has been directed not to select a preferred alternative for the draft IAP/EIS. If you have questions concerning this proposed action, please contact Mr. Joel Hubbard of MMS at (907) 271-6670, or Mr. John Payne of my staff at (907) 271-3431.

We look forward to working with you and your staff in protecting and conserving endangered and threatened species.

Sincerely,

Linda S. C. Rundell
Acting State Director

Enclosures
1 - Notice of Intent (FR November 15, 2001) (5 pps)
2 - Northwest Planning Area Map (1 p)

cc:
NMFS, Anchorage Field Office
MMS, Anchorage Office

Note to readers: To view enclosures see pages Appendix 10-3 through Appendix 10-8.

John — fyi — Received 7/26/02

United States Department of the Interior

FISH AND WILDLIFE SERVICE
1011 E. Tudor Rd.
Anchorage, Alaska 99503-6199

IN REPLY REFER TO:
AFES/FFWFO

JUL 24 2002

Memorandum

To: State Director - Bureau of Land Management

From: Regional Director - Region 7

Subject: Endangered, Threatened and Candidate Species List - Proposed Oil and Gas Lease Sale in the National Petroleum Reserve-Alaska (NPR-A)

This responds to your June 10, 2002, request for a list of endangered, threatened and candidate species, and critical habitats pursuant to Section 7 of the Endangered Species Act of 1973, as amended (Act). The following information is being provided for the development of an Integrated Activity Plan/Environmental Impact Statement (IAP/EIS) for the northwestern portion of the National Petroleum Reserve-Alaska (NPR-A). Activities authorized by the IAP/EIS may include oil and gas leasing, wildlife protection, subsistence and recreation. The information below addresses only species and critical habitats that may be affected by human activities within the Northwest Planning Area. The following listed species are present:

Common Name	Scientific Name	Status
Steller's eider	*Polysticta stelleri*	Threatened
Spectacled eider	*Somateria fischeri*	Threatened

There is no critical habitat within the boundaries of the Northwest Planning Area. The Ledyard Bay Unit of spectacled eider critical habitat includes marine waters within about 74 km (40 nm) from shore, from Cape Lisburne to Icy Cape, excluding waters less than 1.85 km (1 nm) from shore. This area lies southwest of the Northwest Planning Area, but could be affected by increased vessel traffic in support of activities authorized under the IAP/EIS.

This list applies only to endangered and threatened species under our jurisdiction. It does not preclude the need to comply with other environmental legislation or regulations such as the Clean Water Act. Please contact the National Marine Fisheries Service to determine the status of listed and proposed species under their jurisdiction in the action area.

Thank you for your cooperation in meeting our joint responsibilities under the Act. The Fairbanks Fish and Wildlife Field Office is responsible for consultation, pre-listing, listing and recovery activities pursuant to the Endangered Species Act for the geographic region including northern Alaska. If you need further assistance please contact Jonathan Priday with the Fairbanks Fish and Wildlife Field Office at (907) 456-0499.

08/15/02 THU 15:28 FAX 9072715479 BLM-ALASKA-LM&R 002

UNITED STATES DEPARTMENT OF COMMERCE
National Oceanic and Atmospheric Administration
National Marine Fisheries Service
P.O. Box 21668
Juneau, Alaska 99802-1668

July 26, 2002

Linda S. C. Rundell
Acting State Director
Bureau of Land Management
222 West 7th Avenue, #13
Anchorage, Alaska 99513-7599

Dear Ms Rundell:

Thank you for your letter requesting a list of threatened or endangered species occurring in the area associated with National Petroleum Reserve-Alaska (NPRA). The National Marine Fisheries Service is responsible for certain marine species listed under the Endangered Species Act of 1973, as amended (ESA). Of these, only the bowhead whale, Balaena mysticetus, found within the waters of the Beaufort Sea off the Alaska coast, would be expected to occur in or near the NPRA.

Under Section 7 of the ESA, a Federal agency is required to consult with the Secretary of Commerce regarding the presence of these species or their designated critical habitat. If this presence is identified, the agency must then determine if the activity may affect these animals or habitats. If it finds the action would not affect these concerns, no further consultation is required. Otherwise, the action agency should notify NMFS of its findings and request consultation under the Act.

We hope this information is useful in fulfilling the requirements of the ESA. Please direct any questions you may have to Brad Smith in our Anchorage office at (907) 271-5006.

Sincerely,

James W. Balsiger for
Administrator, Alaska Region

UNITED STATES DEPARTMENT OF COMMERCE
National Oceanic and Atmospheric Administration
National Marine Fisheries Service
P.O. Box 21668
Juneau, Alaska 99802-1668

January 7, 2003

Henri Bisson
State Director
Bureau of Land Management
Alaska State Office
222 W. 7th Avenue
Anchorage, Alaska 99513-7599

RECEIVED
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BLM

Dear Mr. Bisson:

We have received your letter of December 3, 2002 requesting formal consultation under section 7 of the Endangered Species Act, as amended, for the Federal management of the National Petroleum Reserve-Alaska (NPR-A). The Bureau of Land Management's (BLM) draft Integrated Activity Plan/Environmental Impact Statement IAP/EIS has been written to serve as the biological assessment of that action, describing the anticipated effects of the alternatives on endangered species and designated critical habitat. The endangered bowhead whale is the only such species for which the Department of Commerce/ National Marine Fisheries Service (NMFS) bears responsibility and that BLM has determined may be affected by this management strategy. No critical habitat has been designated for the bowhead whale.

The draft IAP/EIS describes four alternative strategies for the multiple-use management of 8.8 million acres of public lands in the NPR-A, along with the no-action alternative. All areas proposed for oil and gas leasing are on land. The impacts of these alternatives on the bowhead whale are assessed in the draft IAP/EIS: none of the alternatives described would present more than a negligible level of effect to bowhead whales. While oil spills are a possible adverse impact associated with oil and gas exploration and/or production, we would not reasonably expect any spill from NPR-A to enter the marine environment, nor reach areas of the Beaufort Sea used by bowhead whales. While vessels traffic is not part of the action, the impacts of noise from vessels was assessed for its impact to bowhead whales. Vessels traffic to and from NPR-A is expected to occur well inside of the primary migratory corridor of the bowhead, and to take place primarily in late July and August; after the spring migration and prior to the fall (returning) migration of these whales. While no offshore leases are associated with this action, BLM has identified a potential impact to bowhead whales due to disturbance by noise from helicopter or airplane traffic

associated with NPR-A activities. Because the primary migratory habitat of the bowhead whale is far offshore (e.g. 32 km) of NPR-A, and all leases would be on land, it is very unlikely even this traffic would be detected by whales. Nonetheless, we believe the potential exists for small numbers of whales to be affected by noise due to aircraft. This potential can be avoided, however, by adoption of restrictive measures for aircraft such that minimum altitudes of 1,500 feet are maintained whenever operating beyond (seaward of) 500 feet of the coastline, except during take off and landing. We have discussed this matter with Mr. John F. Payne of your staff, who has tentatively agreed to include such restrictions in any selected alternative. Given this mitigative measure, it is not likely that the management of NPR-A will adversely affect the endangered bowhead whale. No incidental take of bowhead whales is expected for this action. Accordingly, the requirements of section 7of the ESA are satisfied, and no further consultation is necessary. However, NMFS will enter into formal consultation if BLM specifically responds to this letter with such a request.

Please direct any questions to Mr. Brad Smith in our Anchorage office at (907)271-5006.

Sincerely,

James W. Balsiger
Administrator
Alaska Region

United States Department of the Interior

BUREAU OF LAND MANAGEMENT
ALASKA STATE OFFICE
222 W. 7th Avenue, #13
ANCHORAGE, ALASKA 99513-7599

DEC 3 2002

Mr. Donald Knowles
Director, Office of Protected Resources
National Oceanic and Atmospheric Administration Fisheries
1315 East-West Highway, SSMC3
Silver Spring, Maryland 20910

Dear Mr. Knowles:

The Bureau of Land Management (BLM) has completed a draft Integrated Activity Plan/Environmental Impact Statement (IAP/EIS) to update its management strategy for the northwest portion of National Petroleum Reserve-Alaska (NPR-A) on the north slope of Alaska. The IAP/EIS addresses the full range of BLM's management responsibilities in the planning area, including all ground-impacting management actions. Ground-impacting management actions refer to those types of activities that are managed through BLM's regulatory and permitting processes such as oil and gas leasing.

Under Section 7(a)(2) of the Endangered Species Act, the BLM requests formal consultation with the National Oceanic and Atmospheric Administration Fisheries (NOAA Fisheries) on ground-impacting management actions, including leasing and exploration activities associated with oil and gas lease sales. We understand that when the NOAA Fisheries issues a biological opinion for the IAP/EIS, the NOAA Fisheries does not relinquish the opportunity to reconsider and modify that opinion for future proposed management actions or oil and gas lease sales.

To facilitate the timely completion of this consultation, we are providing copies of this memorandum and the attached guidance letter, and two extra copies of this draft IAP/EIS, to the NOAA Fisheries Alaska Regional Office in Juneau, Alaska and to the Anchorage Field Office. The draft IAP/EIS describes BLM's management responsibilities, the listed species most likely to be affected in or adjacent to NPR-A, the potential effects of ground-impacting management actions, the potential effects of proposed leasing and exploration activities, and proposed mitigating measures to reduce potential adverse effects to the listed species. Less detailed information is provided on development and production activities due to their uncertainty at this time. Should commercially producible quantities of oil be discovered and development and production be proposed, appropriate consultation would be reinitiated. The draft IAP/EIS, which serves as our biological assessment for the proposed action, satisfies the information requirements specified in 50 CFR §402.12 and §402.14.

We request that the consultation be concluded within 90 days of initiation as provided for in 50 CFR §402.14(e). Unless you provide written notice of data deficiencies within 30 days of receiving this request, we will assume the consultation is initiated upon NOAA's receipt of this request. We also ask for a draft biological opinion and incidental take statement for our review by the end of the 90-day period. This should allow you to deliver a final biological opinion to the BLM within 45 days after concluding the consultation as provided for in 50 CFR §402.14(e). If you require an extension to the regulatory time frames referenced above, please provide a written request as specified in 50 CFR §402.14(e). This aforementioned schedule should allow you to deliver the final biological opinion to the BLM and allow us to include it in the final Northwest NPR-A IAP/EIS.

If you consider recommending measures to minimize impacts to threatened and endangered species or determine a jeopardy situation may exist for all or any part of the proposed action, we ask that you notify us as early as possible, according to 50 CFR §402.14(g)(5), to allow the BLM and NOAA Fisheries staff time to jointly discuss the findings. We believe that such discussions will facilitate the consultation and ensure effective protection of the listed species. These discussions can also ensure that any proposed alternatives are within our authority to control and implement, and are feasible, appropriate, and effective.

If you have any questions on this consultation or require additional information, please contact John Payne, Bureau of Land Management, Alaska State Office, 222 W. 7th Avenue, Box 13, Anchorage, Alaska 99513-7599 (phone 907-271-3431).

Sincerely,

/s/ Linda S.C. Rundell

Henri Bisson
State Director

Attachment

cc: (w/attachments)

Regional Director
U.S. Fish and Wildlife Service
1011 E. Tudor Road
Anchorage, Alaska 99053

Field Office Supervisor
U.S. Fish and Wildlife Service
Northern Alaska Ecological Services
101 12th Avenue, Box 19
Fairbanks, Alaska 99701

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United States Department of the Interior

BUREAU OF LAND MANAGEMENT
ALASKA STATE OFFICE
222 W. 7th Avenue, #13
ANCHORAGE, ALASKA 99513-7599

1600 (931)

DEC 3 2002

Memorandum

To: Assistant Director for Endangered Species
U.S. Fish and Wildlife Service

From: Alaska State Director

Subject: Endangered Species Act Section 7, Formal Consultation Request for the Integrated Activity Plan/Environmental Impact Statement for the Northwest Portion of NPR-A

The Bureau of Land Management (BLM) has completed a draft Integrated Activity Plan/Environmental Impact Statement (IAP/EIS) to update its management strategy for the northwest portion of National Petroleum Reserve-Alaska (NPR-A) on the north slope of Alaska. The IAP/EIS addresses the full range of BLM's management responsibilities in the planning area, including all ground-impacting management actions. Ground-impacting management actions refer to those types of activities that are managed through BLM's regulatory and permitting processes such as oil and gas leasing.

Under Section 7(a)(2) of the Endangered Species Act, the BLM requests formal consultation with the U.S. Fish and Wildlife Service (FWS) on ground-impacting management actions, including leasing and exploration activities associated with oil and gas lease sales. We understand that when the FWS issues a biological opinion for the IAP/EIS, the FWS does not relinquish the opportunity to reconsider and modify that opinion for future proposed management actions or oil and gas lease sales.

To facilitate the timely completion of this consultation, we are providing copies of this memorandum and the attached guidance letter to the FWS Region 7 Office in Anchorage, Alaska and to the Northern Alaska Ecological Services Office in Fairbanks, Alaska. We are attaching the draft IAP/ EIS for your review and are providing two extra copies of this draft IAP/EIS for FWS Region 7 Marine Mammals Management staff, as requested by your Anchorage Ecological Services Field Office Supervisor. The draft IAP/EIS describes BLM's management responsibilities, the listed species most likely to be affected in or adjacent to NPR-A, the potential effects of ground-impacting-management actions, the potential effects of proposed leasing and exploration activities, and proposed mitigating measures to reduce potential adverse

effects to listed species. Less detailed information is provided on development and production activities due to their uncertainty at this time. Should commercially producible quantities of oil be discovered and development and production be proposed, appropriate consultation would be reinitiated. The draft IAP/EIS, which serves as our biological assessment for the proposed action, satisfies the information requirements specified in 50 CFR §402.12 and §402.14.

We request that the consultation be concluded within 90 days of initiation as provided for in 50 CFR §402.14(e). Unless you provide written notice of data deficiencies within 30 days of receiving this request, we will assume the consultation is initiated upon the FWS's receipt of this request. We also ask for a draft biological opinion and incidental take statement for our review by the end of the 90-day period. This should allow you to deliver a final biological opinion to the BLM within 45 days after concluding the consultation as provided for in 50 CFR §402.14(e). If you require an extension to the regulatory time frames referenced above, please provide a written request as specified in 50 CFR §402.14(e). This aforementioned schedule should allow you to deliver the final biological opinion to the BLM and allow us to include it in the final Northwest NPR-A IAP/EIS.

If you consider recommending measures to minimize impacts to threatened and endangered species or determine a jeopardy situation may exist for all or any part of the proposed action, we ask that you notify us as early as possible, according to 50 CFR §402.14(g)(5), to allow the BLM and FWS staff time to jointly discuss the findings. We believe that such discussions will facilitate the consultation and ensure effective protection of listed species. These discussions can also ensure that any proposed alternatives are within our authority to control and implement, and are feasible, appropriate, and effective.

If you have any questions on this consultation or require additional information, please contact John Payne, Bureau of Land Management, Alaska State Office, 222 W. 7th Avenue, Box 13, Anchorage, Alaska 99513-7599 (phone 907-271-3431).

Attachment

/s/ Linda S.C. Rundell

ACTING

United States Department of the Interior

BUREAU OF LAND MANAGEMENT
Alaska State Office
222 W. 7th Avenue, #13
Anchorage, Alaska 99513-7599

OCT 2 2003

6840 (9310)

Memorandum

To: Regional Director, U.S. Fish and Wildlife Service

From: ACTING State Director

Subject: Reinitiating Endangered Species Act, Section 7 Consultation for Proposed Oil and Gas Leasing Integrated Activity Plan/Environmental Impact Statement for the Northwest National Petroleum Reserve-Alaska

The U.S. Fish and Wildlife Service (FWS) issued a Biological Opinion (BO) on the Draft Integrated Activity Plan/Environmental Impact Statement (IAP/EIS) for the Northwest National Petroleum Reserve-Alaska (NWNPRA) on May 20, 2003. That BO addressed the potential impacts of leasing and exploration as outlined in the Draft IAP/EIS, but, since BLM did not have a preferred alternative at the draft phase, it did not address a reasonably foreseeable development scenario.

The comment period has now closed on the Draft IAP/EIS, and BLM has selected a preferred alternative. Since the preferred alternative was not analyzed as part of the original BO, BLM requests a formal reinitiation of consultation, under Section 7, Endangered Species Act of 1973, as amended (16 USC 1531 *et seq.*).

To reinitiate consultation, BLM has prepared a Biological Assessment (BA) that addresses leasing, exploration, and reasonably foreseeable development within the NWNPRA. To help insure BLM addresses all potential avenues of take of listed species, we have been working with FWS Northern Ecological Service Office, on an informal basis, while preparing the BA.

If you have questions concerning this proposed action, please contact John Payne at (907) 271-3431.

Peter J. Ditton
Associate State Director

Attachment:

Biological Assessment for Threatened and Endangered Species With Respect to the Proposed Northwest National Petroleum Reserve-Alaska Integrated Activity Plan (93 pp)

931:Jpayne:jlh:Sec7memo:wp:10/01/03/5477

Note to Reader: This document contains references to graphics and tables that are part of this EIS. We do not include them in this appendix because they are available to you in the Tables, Maps, and Figures sections.

Biological Assessment for Threatened and Endangered Species With Respect to the Proposed Northwest National Petroleum Reserve-Alaska Integrated Activity Plan

Prepared for Re-Initiation of Section 7 Consultation in Accordance With the Endangered Species Act of 1973, as Amended

Bureau of Land Management
Alaska State Office
October 2, 2003

I. INTRODUCTION AND BACKGROUND

The United States Department of the Interior (USDOI), Bureau of Land Management (BLM) has initiated the process for the Northwest National Petroleum Reserve-Alaska (NPR-A) Integrated Activity Plan/Environmental Impact Statement (IAP/EIS). The management plan will fulfill BLM's responsibility for managing lands in the Northwest NPR-A Planning Area (Planning Area). The plan also fulfills mandates of the President's energy policy to undertake "environmentally responsible oil and gas development in the NPR-A." The BLM is committed to ensuring that ecosystems in the NPR-A remain healthy and productive. The management plan includes various current and future surface-impacting activities that may affect the threatened spectacled and Steller's eiders, such as aircraft use, hazardous- and solid-material removal and remediation, overland moves, seismic activities, and oil and gas leasing/exploration and development/production activities. Such activities, particularly oil and gas activities, temporary camps, and aircraft traffic associated with wildlife studies and other surveys, may result in disturbance, altered habitat, and spills of oil or other contaminants. These could adversely affect the behavior, distribution, and abundance of individual eiders or the population occurring in or adjacent to the Planning Area.

An oil and gas lease sale is scheduled tentatively for May 2004. If held, the NPR-A sale would be the seventh sale held in the NPR-A since January 1982. The first two oil and gas lease sales were held in January and May 1982, respectively. Two subsequent sales followed in 1983 and 1984, and a fifth lease sale was canceled. Sale of Northeast NPR-A leases were held in May 1999 and June 2002. Approximately 129 wells have been drilled in the NPR-A.

This biological assessment document describes the various activities under the management plan and the proposed oil and gas lease sale to the extent feasible; the distribution, abundance, and habitat use of listed eiders; the potential impacts of proposed oil and gas leasing as well as exploration, development, and production activities that might occur in the future; the potential impacts of other prescribed activities; and proposed mitigating measures that might reduce potential adverse effects on these eiders. This assessment provides sufficient information on listed eiders and potential impacts of proposed activities and activities that might occur in the future to support issuance of a biological opinion regarding the reasonable likelihood of the entire action violating Section 7(a)(2) of the Endangered Species Act, as amended. This is in response to a reinitiation of consultation on the Northwest NPR-A IAP.

The analysis incorporates conservative estimates of potential oil and gas development and production impacts on listed eiders (i.e., it attempts to estimate maximum potential impact to eiders given the entire range of potential impacts). Should commercially producible quantities of oil be discovered and development and production be proposed, consultation would be reinitiated regarding these activities. We also would consider the need for further consultation if (a) additional species were listed or critical habitat designated, (b) the proposed actions were substantially modified, or (c) significant new effects-related information was developed.

A detailed description of the endangered and threatened species within the Planning Area and effects analyses of similar proposed actions were included in the following previously issued environmental impact statements and biological opinions:

USDOI, BLM and MMS. 1998. Northeast National Petroleum Reserve-Alaska Final Integrated Activity Plan/Environmental Impact Statement. BLM/AK/PL-98/016+3130+930. Anchorage, Ak.

USDOI, BLM and MMS. In prep. Northwest National Petroleum Reserve-Alaska Final Integrated Activity Plan/Environmental Impact Statement.

USDOI, FWS. 2003. Biological Opinion for the Northwest National Petroleum Reserve-Alaska Integrated Activity Plan/Environmental Impact Statement, May 2003.

USDOI, FWS. 1998. Biological Opinion for the Northeast National Petroleum Reserve-Alaska Integrated Activity Plan/Environmental Impact Statement, March 17, 1998.

USDOI, MMS, Alaska OCS Region. 2003. Beaufort Sea Planning Area Oil and Gas Lease Sales 186, 195, and 202, Final EIS. OCS EIS/EA MMS 2003-001. Anchorage Ak.

Tables (II-01,II-03, IV-05, IV-07, IV-13, IV-19, IV-20, IV-28, IV-29, App 9-06, App 9-14); Maps (18, 62, 63, 105,108); and Figure (IV-01) were developed for the Northwest NPR-A Final IAP/EIS, and we have retained the numbering system from the EIS. They can be found after Section V in this document and in the EIS. Table II-03 of this document is the text for all of the lease-sale stipulations and required operating procedures from the EIS and is presented at the end of this document.

II. DESCRIPTION OF PROPOSED ACTIVITIES USING THE AGENCY PREFERRED ALTERNATIVE AND KEY ASSUMPTIONS IN THE ANALYSIS

II.A. Reasonable and Foreseeable Oil Development Scenario and Key Assumptions

Using the Preferred Alternative (Map 18), all BLM-administered lands within the Northwest NPR-A Planning Area would be made available for oil and gas leasing, although leasing would be deferred for 10 years on approximately 1,570,000 acres (17 percent) of the western portion of the Planning Area in the vicinity of Wainwright.

The reasonably foreseeable development scenario is based on a comprehensive geological analysis and computer simulation modeling completed in 2002 by the Minerals Management Service (MMS) and BLM. In this analysis, the results of petroleum resource characteristics of commercial fields, and areas where these fields are likely to be discovered and developed are modeled using an average oil price of $30 per barrel. The exact locations for future commercial projects are impossible to define prior to exploration drilling. It is uncertain any commercial fields would be discovered, particularly if oil prices fall below $20 per barrel.

II.A.1. Hydrocarbon Potential and Economics

Under the regulatory conditions of the Preferred Alternative, it is estimated that up to eight new fields would be developed as a result of multiple lease sales conducted in the Planning Area. Oil and gas fields on Alaska's North Slope typically are composed of one or more subsurface pools. These pools may or may not be grouped so that they can be produced from a common infrastructure. The first fields developed would be oil fields. Currently, no infrastructure exists to transport natural gas from the North Slope to a market. While natural gas is a byproduct of oil development, BLM does not consider natural gas production as reasonably foreseeable.

Assuming $30-per-barrel oil, 1,260 million barrels of oil could be developed in the Planning Area. Analyses of the geologic plays indicate commercial fields are most likely to be discovered in the portion of the Planning Area designated "High Potential" area (map 105) (defined as the area having the highest economic potential for oil development, based on $30-per-barrel oil). This is the coastal area surrounding Dease Inlet and west of the Ikpikpuk River.

In previous oil leases, larger fields typically have been found earlier in the exploration cycle, and are more likely to be economically viable. This reasonable and foreseeable scenario assumes the first fields developed in the Planning Area would approximate the size of the Alpine field (Figure IV.01) in extent of gravel cover, petroleum resources, associated activity, and current technology. The following hypothetical discovery and related reasonably foreseeable development, and production schedule, is BLM's estimate of the types and timing of activities that may occur as a result of multiple lease sales under the Preferred Alternative.

Analysis is based on two distinct, but related phases, in the discovery and development of an oil field on the North Slope of Alaska. In the first phase a lease sale is held, followed by the successful lessee entering into an exploration program. The second phase is success in discovery, followed by the construction of production facilities, operation and, in approximately 30 years, abandonment of the sites.

II.A.2. Key Assumptions for Analysis

Key assumptions for this biological assessment ensure the analysis is conservative with respect to the listed species. The following reasonably foreseeable scenario assumes all of the projected development would occur in the area of high potential for oil and gas development (Map 105).

The densities of listed eiders within the Planning Area are assumed equal to the highest densities of listed eiders observed within the area of highest geologic potential (Map 105). The spectacled eider density figure used for this analysis was derived from a multiyear aerial survey data set (1992-2002) collected by the Fish and Wildlife Service (FWS). This survey was designed and timed specifically for eider detection across the Arctic Coastal Plain (ACP). The area of high geologic potential includes areas of high spectacled eider density; thus, BLM chose the high end of the range of spectacled eider densities (1.11 birds/km^2) as the basis for analysis.

The density figure for Steller's eiders was derived from a multiyear aerial survey data set (1999-2002) designed specifically for detecting Steller's eiders in the "Barrow Triangle," a 2,757- square kilometer area south of Barrow and west of Admiralty Bay, which overlaps with the area of highest geologic potential (Map 105). Density values are available only for the survey area as a whole and vary considerably among years. The BLM chose to use the density recorded in 1999 (0.06 birds/km^2), which was the highest density recorded in the 4 years of the survey. This is considered to be a midlevel density, lower than that recorded on foot surveys in the immediate vicinity of Barrow, but higher than the overall average density across the ACP, as determined by FWS aerial eider surveys. This midlevel density figure was selected, because no high-density Steller's eider areas have been found in the area of high economic potential.

The selected densities are intended to represent the high end of a reasonable range, in recognition of the uncertainties regarding the future location of facilities, as well as imprecise information on eider distribution. Use of these density figures would likely result in the overestimation of potential impacts to listed eiders, thus ensuring that if development occurs elsewhere in the Planning Area, the effects generally would be equal to or less than those noted in this assessment. The assumed densities, however, do not compensate for the bias inherent in estimating bird densities from the air. An established/accepted visibility correction factor is not currently available to apply to eiders detected on the aerial surveys. A visibility correction factor allows the numbers of individuals observed from the air to be converted to a more accurate representation of the actual number of birds present, compensating for those birds that are not detected from the aircraft. In the absence of such a correction factor, BLM assumes the aerial survey data used for this biological assessment may underestimate both population and densities of listed eiders within the Planning Area. However, using the highest densities and providing an analysis using the $30-per-barrel cost, zone of influence, assuming the six satellite fields will have their own separate 20-mile connection road to the anchor facility and not considering Required Operating Procedure E-11 (Table II-03), BLM likely would overestimate the potential effect on both species of eider.

To address disturbance effects to eiders, in addition to the immediate habitat loss from gravel pad and road development, BLM is assuming both a 200- and a 500-meter zone of influence around all gravel pads and roads. The 200-meter zone of influence has been used in previous analysis by FWS but is based on best professional judgment, and little empirical data supports its use. The BLM also has chosen to provide a

500-meter zone of influence to allow for a determination of the maximum number of eiders that potentially could be affected by production facilities.

The Preferred Alternative provides an opportunity to lease in the immediate offshore area of the Planning Area, which includes Dease Inlet and Admiralty Bay. These shorelines are protected by a ¾ mile no surface occupancy (NSO) requirement (Map 18), both offshore and onshore, to protect the nearshore habitats. While reasonable and foreseeable projections do not anticipate production facilities offshore, these areas likely would be included in the exploration phase. The offshore areas would be reached using directional drilling techniques either anchored onshore or from bottom-founded offshore ice islands. All exploration activities would occur in winter and use ice roads to move equipment and materials from the staging areas to the exploration sites.

Development assumes 36 exploration wells and 36 delineation wells using three exploration drill rigs. Previous experience, in an unproven, high-cost, frontier area, has shown 36 exploration wells typically are required to discover an estimated eight economically developable fields (at $30 per barrel oil). Delineation and appraisal exploration would require three winter seasons to determine the extent of each field. While exploration activities primarily would be a winter exercise, "cold stacking," or the storage of exploration equipment, would occur at designated sites that are accessible by helicopter or fixed-wing aircraft during the summer season to allow for occasional routine inspection.

For analysis it is assumed development would include two "anchor" developments (Alpine-like[1] in design, Figure IV.01), each with three connected satellite facilities connected to each anchor, for a total of eight fields. Anchor developments are "stand-alone" facilities with processing equipment for separating oil and gas, waste handling, and transport of oil through pipelines to large-scale distribution systems. Satellite developments involve fields too small to support full-scale operations and must rely on anchor facilities to separate the oil and gas, waste handling and the transport of oil to large-scale distribution systems. Each Alpine-like anchor development would consist of both a production and a processing facility. Current technology and economic considerations limit satellite fields to a maximum of 20 miles from an anchor facility. Current technology allows for "roadless" facilities, which means roads would exist within and between the satellite and anchor developments, but no roads would connect the two anchor developments to each other. No "feeder" roads would be constructed connecting existing infrastructure in the Alpine area to either of the anchor developments. Geologic information, economics of extraction, and proximity to existing infrastructure in the Colville River Delta suggest this reasonably foreseeable development would take place within the area of high economic oil and gas potential. Within the Planning Area, the highest potential for success is in the northeast portion of the area (Map 105). None of these facilities would require the establishment of new landfill locations. The approved landfill currently in operation at Deadhorse most likely would be used for materials not requiring additional treatment. Organic wastes would be disposed of in accordance with the Clean Water and Clean Air Acts, and the disposal of any liquid or solid waste would not be permitted on site (Required Operating Procedure A-2, Table II-03).

Assuming the first lease sale occurs in 2004, the first exploration activities would occur in the winter of 2004, and the first discovery in 2006.

II.B. Phase I: Leasing and Exploration

The Preferred Alternative indicates the first lease sale in early in 2004, with leases issued later that year. Exploration actions would begin the following winter season.

[1] The Alpine development, owned and operated by Conoco/Phillips-Alaska, incorporates the most recent design and operational technology on the North Slope of Alaska. The footprint of this development is the most likely development type in the Northwest NPR-A.

II.B.1. Seismic Activities for Exploration

Seismic surveying occurs during the winter months and is expected to begin during the winter season of 2004-2005. Typically, three to four seismic crews are active on the North Slope each winter, and one to two of those crews could be expected to collect seismic data in the Planning Area in future years. Seismic crews are housed in mobile camps consisting of a "cat train" of trailer sleds pulled by tractors. Winter seismic operations are conducted by all-terrain ground vehicles and supported by light aircraft. Current seismic technology uses vibrator equipment (vibroseis) to generate energy into the subsurface. A limited amount of support by aircraft (fixed wing and helicopter) would be needed to survey potential sites during summer months to prepare for intensive activities.

The only activities associated with seismic that would occur during the summer would be annual maintenance. Following the end of each winter seismic season, each seismic crew stores its equipment at some staging area, which is usually an existing gravel pad built previously for some other purpose (during exploration in the Northeast NPR-A, seismic equipment was stored in the summer of 2003 at Lonely and Inigok, both previous development areas). Sometime during the summer, a repair crew would spend 2-4 weeks performing annual maintenance and installing upgrades to the seismic equipment. These activities would require aircraft support, with one to two fixed-wing and two to three helicopter flights per week. On completion of the maintenance work, the crew would leave the equipment cold stacked and there would be no activity until the following winter. For analysis purposes, we assume the maintenance operation would be self contained and use accommodations that are part of the seismic camp. Also on completion of the work, all wastes would be removed and disposed of at approved disposal sites on the North Slope. None of these activities would require the establishment of new landfill locations. The approved landfill currently in operation at Deadhorse most likely would be used for materials not requiring additional treatment. Organic wastes would be disposed of in accordance with the Clean Water and Clean Air Acts, and the disposal of any liquid or solid waste would not be permitted on site (Required Operating Procedure A-2, Table II-03).

II.B.2. Exploration Drilling

There would be a maximum of three exploration drill rigs available for use in the Planning Area at any one time, over a 10-year maximum exploration phase.

Drilling depths for exploration and delineation wells average 10,000 feet but are likely to range from 6,000-12,000 feet. Drilling would be conducted entirely during the winter months (early December to mid-April). A typical exploratory well (10,000 feet) could use about 630 short tons of drilling mud and produce about 820 short tons of dry-rock cuttings. On completion of drilling operations, all equipment and materials would be removed (during winter operations) over ice roads to staging areas and then to other locations on the North Slope, or to recycling centers out of the country. Drilling material (mud and cuttings) could be reinjected into the dry drill hole if the exploration well is unsuccessful. If drilling is successful, the well would be temporarily capped, and the operator would remove drilling materials (mud and cuttings) and other camp wastes to an approved disposal area off site in accordance with the Clean Water and Clean Air Acts. No liquid or solid waste would be disposed of on site.

The Preferred Alternative provides an opportunity to lease in the immediate offshore area of the Planning Area, which includes Dease Inlet and Admiralty Bay. All activities would occur in winter, and use ice roads to move equipment and materials from the staging areas to the exploration sites.

II.B.3 Winter Transportation and Support Infrastructure for Exploration

Ice roads would provide seasonal routes supporting winter activities. These temporary roads are constructed by spreading water from local sources (rivers and lakes) to build up a rigid base (Stipulation B-1). New construction methods, such as the use of aggregate chips produced from frozen lakes, significantly

decrease both water demands and construction time for ice roads. Low-pressure vehicles are used to establish ice roads, which can then be used by conventional vehicles. Ice roads are designed to be a minimum of 6 inches thick, 30-35 feet wide, and up to 50 miles long. Ice roads would connect each exploration drill site to the staging area during winter activities.

Ice pads are used commonly as platforms for winter exploration activities (e.g., Northeast NPR-A exploration, 1999-2003). Methodology used in ice pad construction is similar to ice roads. The tundra surface is flooded with water to build up progressive layers of ice. Just as for ice roads, the use of aggregate chips speeds the process while decreasing water use. A typical ice pad is designed to be a minimum of 1 foot thick, covers 6 acres, and requires approximately 500,000 gallons of water to construct. Depending on the exploratory well location, ice pads range in size from 3-10 acres. Current ice-pad design technology could provide for some pads to remain intact over the summer season. During the summer season, these ice pads would house one exploration drill rig. Each of these rigs would be stored with towers or derricks folded and would present a silhouette of approximately 20 feet in height. The impact of this activity could result in a temporary loss of eider habitat equivalent to the ice-pad size (3-10 acres).

Materials and equipment necessary to support winter exploration activities could be moved to staging areas within the Planning Area by marine transport in the summer months (late July/August), and then overland on ice roads or hardened snow trails during winter exploration activities. The sealifts for exploration would use two to seven barges per year. The majority of large equipment movement would be by sealift to staging areas at Cape Simpson, Deadhorse, or Barrow or during summer months, then to the exploration pads over ice roads during winter months. These exploration staging areas would be small (500 feet by 500 feet and gravel or sand-gravel pads), with summer activity limited to offloading and storage. When possible, existing pads would be used. These activities would occur annually during the exploration phase, which may last up to 9 years after the sale.

While this scenario assumes that Barrow could be used as a staging area for the western portion of the Planning Area, BLM does not anticipate development projects for direct support of exploration activities at or near that community. Barrow already is a regional hub for commerce on the western North Slope, with an established airport and support facilities that can accommodate most large planes currently used to support the oil and gas industry in Alaska. Infrastructure currently exists in Barrow to handle sealifts during summer months and air freight during winter months that routinely stock the community.

There would be some additional employment and investment in the community during the exploration and construction phases, but the level of additional employment would be small and short term. The majority of support for exploration is expected to be deployed from Deadhorse because of its proximity to the Dalton Highway (Haul Road) and existing oil field contractor-support facilities and infrastructure.

II.C. Phase II: Development, Production, and Abandonment

If exploration activities are successful and an economically viable field is discovered, companies likely would move forward to development and production. The first part of these processes is the gathering of information and data, designing, and permitting of the project. All development projects would have to go through a National Environmental Policy Act evaluation and would require consultation with the FWS pertaining to the listed eiders. If ice roads or pads are needed during the production and abandonment phase, these activities would be essentially the same as those described in II.B.2.

II.C.1. Drill-Pad and Road Construction

Construction of gravel pads, roads, airstrips, and staging areas would be some of the first development activities to take place.

Current technology uses gravel pads to support both anchor and satellite production facilities. Gravel requirements for current “all-gravel” pads raised 5 feet or more above a wet tundra surface are

approximately 8,000-12,000 cubic yards per acre of surface footprint. Gravel roads (35 feet wide with 2:1 slopes) cover approximately 5-6 acres per mile, and require 30,000-50,000 cubic yards of gravel per mile. Airstrips (150-200 feet wide, and 5,000-6,000 feet long) cover 20-30 acres and require 140,000-300,000 cubic yards of gravel. Total gravel estimates for an Alpine-like field, with a footprint of 100 acres, is approximately 1,000,000 cubic yards. Any staging area or pump station sites would have similar gravel requirements. A staging area (150 acres) and pump station (40 acres) would require an additional 1,400,000 cubic yards of gravel.

Gravel mining and transportation would occur during winter months when gravel can be moved by heavy equipment over ice roads. Where gravel extraction has occurred on the North Slope, sites are 20-50 acres in size. Two anchor development sites and six satellite pads with roads would require the development of up to eight extraction sites. The location of those potential mine sites is unknown at this time. If larger sites are discovered, extraction footprint per site could exceed 50 acres in size but the number of sites would be reduced, and the total disturbance footprint also would be less (280 acres). Gravel extraction sites necessarily would be located within the area of highest geological potential because of the high cost of material transport.

II.C.2. Field Development

It is assumed that two Alpine-size fields, or anchor developments, would be discovered in the Planning Area, with six additional satellite fields tied into the infrastructure of the anchor fields. Each anchor facility would produce an estimated 450 million barrels of oil, with each satellite facility producing an estimated 60 million barrels. A reasonable and foreseeable scenario suggests each satellite field would be connected to an anchor development (Alpine-size) field. Current pipeline engineering constraints dictate satellite fields be located within 20 miles of an anchor field. Discovered fields that do not have enough oil to be economically developed, or are too far away from an anchor development using today's technology, would not be developed and would have no pads. None of these facilities would require a new landfill location. Organic wastes would be disposed of in accordance with the Clean Water and Clean Air Acts. No liquid or solid waste would be disposed of on site.

Each anchor development would consist of gravel pads covering a total of 100 acres (including an airstrip of 5,000 feet, secondary drill pad, and connecting road). Runways would be oriented in a west-southwest/east-northeast direction similar to the Barrow Airport. Each anchor development would have a secondary drill pad located within a 3-mile radius of the main pad. The secondary pad would be connected to the anchor facility by a 3-mile long gravel road. No overnight accommodations would be available at the secondary pad.

A typical satellite field would be developed from a single gravel pad with a footprint of approximately 10 acres. Each pad would hold approximately 20-30 wells and would be accessed from the anchor development on a permanent gravel road 30-35 feet wide, with a 2:1 aspect, and up to 20 miles in length. Three satellite fields would be developed for each anchor facility. However, satellite field development would not be expected for several years after the anchor facility is developed (this is true of the Alpine development), and would have a production life of approximately 10 years.

The total area of gravel footprint for all above potential developments, as well as for two scenarios for summertime "zones of influence" (i.e., zones of potential disturbance to eiders) around the gravel pads is presented below in Table 1.

Table 1. Gravel Footprint and Zones of Influence for Production and Related Facilities

Activity	Gravel Footprint in Acres (km^2)	200-Meter Zone of Influence in Acres (km^2)	500-Meter Zone of Influence in Acres (km^2)
Anchor Developments (2 at 100 acres each)	200 (0.8)	1,590 (6.4)	3,980 (16.1)
Satellite Developments (6 at 100 acres each)	600 (2.4)	19,100 (77.2)	47,700 (193)
Roadless Pump Station	40 (0.2)	240 (1.0)	600 (2.4)
Gravel Extraction Sites (8 at 20-50 acres each)	280 (1.1)	n/a	n/a
Staging Area (2)	300 (1.2)	680 (2.8)	1,680 (6.8)
Total Area	1,420(5.7)	21,610 (87.4)	53,960 (218.3)

The time required to drill, and complete, a production well depends largely on the measured depth of the well. Currently on the North Slope, it takes approximately 20-30 days to drill and complete a 10,000-foot well. This equates to approximately 12-18 wells per rig in an over a 12-month period. There would be a maximum of eight development rigs operating at any given time over a period of 6 years (Table IV-02). Safety considerations normally restrict operations to one rig drilling on each pad at a time. Using the above example where up to 30 wells from each pad are needed for initial reservoir development, drilling operations would take 3-4 years to complete. The overall development phase from construction of a staging area and remote base camp to production startup could take up to 5 years, depending on the size and location of the new field.

The description of exploration activities in Section II.B.3 (Winter Transportation and Support Infrastructure for Exploration) for staging areas and sealifts also is applicable during the development phase, with respect to time and types of activities. During development, the staging area(s) may be larger, up to 150 acres. Development of the staging area would occur in winter prior to the start of development activities. The number of barges required in each sealift to support development activities would be larger (up to 20 barges/year). However, the modules and equipment still would be offloaded from barges in 3-5 days and stored on the staging area pad until winter, when they would be transported by ice road to the anchor development site. The individual modules could be 20-30 feet in height. After transportation to the anchor development sites, these modules would become the site's operation and housing facilities complex. There likely would be two large sealifts (1 year apart) for each anchor development.

II.C.2.a Development of Production Pad and Facility

The first production pad (anchor pad) would be installed in 2012 (8 years after the lease sale). Up to 150 production and injection wells would be drilled year-round from three drilling pads over a period of 6 years. A maximum of eight drill rigs would be used to drill wells.

II.C.2.b. Central Production Facility

The central production facility (or CPF) serves as the operational center for long-term production activities in an oil field. In addition to oil-production equipment, the CPF typically includes living quarters, offices, maintenance shops, storage tanks for fuel and water, power generators, waste-treatment units, and a communications center. For most North Slope projects, many components of the CPF are constructed as transportable modules in offsite locations, normally outside Alaska, and then moved to staging areas in the summer by sealift. The following winter they are moved overland on ice roads to the field and assembled. All buildings are supported on pilings to accommodate ground settling or frost heaving. An airstrip usually is located near the CPF to allow transport of supplies and personnel to the field site.

Power, telephone, and other communication lines would be buried in the roads or installed on the pipeline vertical support members (VSM's). Each anchor facility would have one tall (up to 60 feet)

communication tower. ROP E-11 provides for mitigation to mark the tower guy wires, increasing visibility to reduce potential collision by listed eiders. Communication towers would be co-located on facility pads.

Oil production equipment includes three-phase separators (oil, gas, and water are produced in varying proportions from each well); gas conditioning (natural gas liquids are striped from produced gas); complex pipeline gathering and pressure regulation systems; and well monitoring and control systems. Oil from production wells is filtered (to remove sand) and processed (removing water and gas) before being piped through a sales meter and into the sales-oil pipeline system. Gas is processed (to remove liquids), pressurized (compressed), and reinjected into the reservoir through service wells. Likewise, water is processed (chemically treated) and then reinjected into the reservoir for pressure maintenance. Reinjection of produced gas and water increases oil recovery, and this practice is normally initiated from the onset of production.

II.C.2.c. Pipeline Infrastructure

The actual locations of new pipelines constructed in the Planning Area depend on both the location and sequence of discoveries of commercial-sized oil fields. Fields developed early would establish the first pipeline corridors connecting the Planning Area production to existing infrastructure at Alpine. Fields discovered and developed later would attempt to use these existing pipelines, if capacity is available. If large fields are discovered late in the exploration sequence, they may require their own oil pipelines. It is possible that commercial-sized fields discovered by different companies would be shut in (not produced) until an agreement is reached to share the costs of constructing a large main line from the Planning Area to common carrier pipelines that connect to the Trans-Alaska Pipeline System. In this analysis, one connecting pipeline would be constructed to the existing Alpine facility, which has infrastructure available to connect to the Trans-Alaska Pipeline System.

The scenario developed for the Preferred Alternative assumes that 240 miles of pipeline would be installed during the winter, coinciding with the construction of the development and production facilities. It would consist of approximately 115 miles of elevated field gathering lines for oil and 125 miles of elevated oil trunk lines. The gathering pipeline would consist of a connecting multiphase pipelines (a 24-inch oil pipeline, a 14-inch water pipeline, and a 10-inch gas pipeline) installed aboveground on VSM's, and would be an average of 7 feet above the tundra. The VSM's would be spaced 50-70 feet apart. Routine pipeline maintenance would occur during winter months, with summer activities on an emergency basis only.

Possible future pipeline corridors in the Planning Area are speculative, but routes would be based on several factors including oil-resource potential, previous leasing, and previous discoveries. The actual location of undiscovered, commercial-size fields and the timing of discovery, are impossible to predict. For analysis purposes, 225 miles of common carrier trunk line would be constructed in the Northeast NPR-A area, with an additional 120 miles constructed on State lands to the east to transport product to market (Map 108).

None of the above pipelines would be established as subsea infrastructure.

II.C.2.d. Aircraft Support during Development

The highest level of human activity would occur during the period when both construction and development drilling are occurring. From June 1, 2001, to July 15, 2002, there were a total of 1,474 aircraft landings or take offs (a daily average of 32.8 operations) at the Alpine site (Johnson, et al, 2003; ABR, Inc., 2001). About half of the aircraft operations were helicopter flights. The next largest group is primarily passenger planes (CASA, Twin Otter, Navajo, Beech), averaging seven flights per day. On average, there was one DC-6 round trip flight per day. We expect similar levels of aircraft activity during the summer development phases for each of the anchor developments.

II.C.2.e. Offshore Development Related to the Planning Area

The Preferred Alternative provides an opportunity to lease in the immediate offshore area of the Planning Area, including Dease Inlet, Admiralty Bay and Elson Lagoon. The shorelines are protected by a ¾ mile NSO (Map 18) requirement, both offshore and onshore, to protect the nearshore habitats. Reasonably foreseeable projections do not anticipate production facilities offshore. If a commercially viable discovery is made in the offshore area, it most likely would be reached using directional drilling techniques anchored onshore, and a new analysis would be prepared to address the specific issues related to offshore production. If development occurred offshore, it likely would be constructed using materials and techniques similar to those used at island bearing the Northstar development (U.S. Army Corps of Engineers, 1999).

Most of the construction activities for the island and for the buried subsea pipeline would occur during the winter months. Barges would be used to bring equipment and facilities to the island as part of the annual summer sealift operations. Helicopters would be used to transport people and equipment year around. Boats could be used during summer months, and an ice road would be built each winter to facilitate the movement of people and equipment from staging areas to island facility. The number of helicopter trips would depend on the location of the island and its proximity to other staging areas.

II.D. Production

The field infrastructure would include processing facilities and a permanent airstrip and would operate year-round for at least 20 years. The first production would start up in 2013 (9 years after the lease sale), and peak rates would be 38 million barrels per year (104,000 barrels per day).

II.D.1. Production Activities

During production, the size of the gravel footprint would remain constant. There would be higher levels of human activities at the two anchor development sites than at the satellite, or secondary pads. The number of aircraft flights to support the facility is estimated at four propeller-driven passenger planes (CASA, Twin Otter, Navajo, Beech) and 5-10 helicopter flights per week. There would some truck traffic from the main facilities to satellite and secondary pads on a daily basis. There would be helicopter flights along the length of the pipeline to monitor its integrity on a monthly basis at a minimum.

The pipelines would be pigged and electronically monitored to determine pipeline integrity. Pipeline maintenance would be planned and occur during the winter months when the pipeline could be readily accessed by ice road or hardened snow trail.

Wastes generated at the production facility would be incinerated at the facility or treated and transported to approved disposal sites on the North Slope.

II.D.2. Watercraft Support to Production Facilities

It is likely that facilities would be supplied by annual sealift. Most of these supplies would arrive in containers by barge in late July or August. The container would be offloaded with cranes and stacked on the gravel pad at the staging area. The typical container is less than 10 feet in height. This vessel traffic generally would be limited to routes in shallow, nearshore waters between staging areas connected to existing infrastructure (e.g., West Dock, or Oliktok Point) and staging areas along the coastline in the Planning Area at Cape Simpson or Barrow.

Nonrecreational airboat use is allowed on streams, lakes, and estuaries seasonally accessible by motorboats. Airboats would be prohibited in seasonally flooded tundra and shallow waters with wetland vegetation adjacent to streams, lakes, and estuaries (Table II-01). For this analysis, it is assumed no facilities would

be constructed adjacent to waterways that could support nonrecreational use of watercraft because of setbacks required by stipulations K-1, 2 and 3.

II.D.3. Public Access and Subsistence Activities

The developments described would not be accessible to the general public for recreational or tourism activities. However, the areas would be available to rural subsistence users. Subsistence use of the Planning Area is variable due to the availability and location of species available for subsistence harvest. It is possible that an unknown number of subsistence activities could be enhanced by the road infrastructure described in this reasonably foreseeable scenario, but it is not quantifiable.

II.D.4. Spill-Response Training and Research Activities

There likely would be annual summer oil-spill-response training, which could involve 20-40 individuals for 1-2 days each summer at each anchor facility. There would likely be an increase in aircraft landings and take offs and, if the facility is near water, there likely would be increase watercraft activity.

Boats and other watercraft could be used by researchers during study efforts if facilities, or areas of concern, were located near large waterbodies such as the Beaufort Sea, rivers, or large, deepwater lakes. These activities would occur during the summer months, but their numbers, locations, and type of activities remain speculative.

II.E. Abandonment and Restoration of Production Sites

Abandonment and reclamation of satellite fields likely would coincide with abandonment and reclamation of corresponding anchor development sites. Abandonment operations include removal of all equipment, cutting well casings a minimum of 3 feet below the surface, and plugging wells. Gravel, or gravel/sand pads would not be removed but allowed to bed naturally. Overall, abandonment operations would take many years, as revegetation and environmental monitoring studies continue to document the long-term effects of operations at a particular site. A series of permitting and inspection activities are associated with abandonment procedures (Stipulation G-1). Abandonment activities would occur during winter months when ice roads could be constructed to allow the removal of equipment. Monitoring abandonment would require periodic revisits to gather information on environmental parameters related to natural bedding and to document success of abandonment actions. Normally, one helicopter with a crew of three would visit the sites annually for the first 5 years followed by increasing time gaps over the next 10 years. Site visits would include a maximum of 1 day per visit, and one visit/year.

II.F. Lease Stipulations and Required Operating Procedures

The Preferred Alternative includes mitigating measures that are designed to reduce the potential take of spectacled and Steller's eiders. These measures are either stipulations (conditions that apply to the lease) or required operating procedures (requirements that would apply to permits for activities associated with oil and gas operations). The full text for all stipulations and required operating procedures is given in Table II-03. Those stipulations and required operating procedures directly applicable to mitigate take of eiders are summarized in the following:

- Requiring surveys in the vicinity of proposed developments to prevent the taking of spectacled and Steller's eiders, which are listed as a threatened species under the Endangered Species Act,

thereby reducing incidental take by establishing better baseline information on the species near developments.

- Requiring all utility and communications lines to be buried in access roads or installed on the pipeline VSM's.
- Requiring all facilities greater than 20 feet in height to have special lighting protocols. All communication towers, antennas, and similar facilities requiring support wires would be required to have markings to make support wires more visible to low-flying birds.
- Requiring all facilities to be designed to prevent the nesting, denning, etc. of predatory species including gulls, ravens, raptors, foxes, bears, etc.
- Requiring lessees to develop oil-spill-response plans prior to any exploration or development drilling.
- Relocating drilling pads and facilities, if necessary, up to 2 miles from optimum pad location (the current North Slope maximum extended reach is 4 miles and a 2.5 departure ratio), if surveys indicate relocation is necessary to avoid take.
- Imposing restrictions on the establishment of permanent or temporary facilities on all deepwater lakes (lakes with depths greater than 7 feet) and prohibit permanent facilities within ¼ mile of such lakes. No permanent facilities would be permitted in the streambeds of rivers. A no permanent surface occupancy setback of ½ mile would be imposed on all major rivers (measured from the centerline of the river as determined by current hydrology at the time of application). Along rivers or river segments where subsistence concerns have been raised, setbacks for no surface occupancy increase to ¾ mile.
- Limiting activities along the entire coastal area of the Planning Area. Permanent support facilities would be located at least ¾ mile inland from the coastline to the extent practicable. When technological limitations, economics, logistics, or other factors require that a facility be located within ¾ mile inland of the coast, the practicality of locating the facility at previously occupied sites such as the former Cape Simpson DEW-line sites would be considered. Use of existing sites within ¾ mile of the coastline also would be acceptable where it is demonstrated that use of such sites would reduce impacts to shorelines or otherwise be environmentally preferable.
- Limiting seasonal activities on Dease Inlet, Admiralty Bay, Elson Lagoon, and associated barrier islands, by allowing oil and gas exploration activities to take place only between October 15 and May 15 of each year. Special stipulations would be imposed for exploration and development, including a setback ¾ mile from shoreline seaward and around natural islands (excluding the barrier islands) within which no development could occur on or under the water. Standards that would have to be met before authorization would be granted for permanent facilities within the setback area would be intentionally set high, with the burden of proof resting with the lessee to demonstrate that approval by BLM is warranted. These standards address specific concerns raised by the North Slope Borough, local communities and residents about conflicts between oil and gas activities and seasonal concentrations of fish, wildlife, and waterfowl that frequent the area; associated subsistence uses and access on these important waterbodies; navigation hazards; spill-response capabilities; and special consultation procedures.
- Recommending the designation of the 102,000-acre area of Kasegaluk Lagoon as a Special Area with a prohibition on permanent surface occupancy (i.e., development facilities and staging areas).
- Restricting overland travel and associated activities for permitted uses.
- Confining recreational off-highway vehicle (OHV) use to winter use for snow machines and other low-ground-pressure vehicles. Within the NPR-A, no summer recreational use of OHV's would be permitted. The summer use of OHV's, including all-terrain vehicles (ATV's) and airboats, to support traditional subsistence activities and access would be allowed. The use of airboats during the summer would be limited to streams, lakes, and estuaries that are otherwise seasonably accessible by propeller- or jet-powered motorboat. To prevent impacts to soils, water quality, vegetation, and wildlife (especially nesting waterfowl), airboat use in areas of seasonal flooding of tundra and temporary shallow waters adjacent to streams, lakes, and estuaries would be prohibited.
- All facilities would be removed and rehabilitate to the satisfaction of the AO.

II.H. Private Lands

While there are private lands owned by the Arctic Slope Regional Corporation (ASRC) in the Northwest NPRA area, the best available geologic information about these areas is from the two existing gas fields near Barrow. Currently, the area is thought to be gas prone and, without a transportation system to a larger market, it is unlikely that there would be extensive interest in leasing and developing those lands at this time. The development of ASRC lands is considered to be speculative at this time, but the potential construction of pipelines and support facilities associated with development of fields in the Northwest Planning Area would reduce the potential development costs of oil and gas fields on private lands.

II.I. Other Key Assumptions

The North Slope Borough would be able to tax and receive income from the development of any oil and gas resources developed from these proposed activities. These taxes would add to the income available to the Borough for capital expenditures or to fund Borough operations. However, these potential projects would come on board at the same time income other taxable projects, such as Prudhoe Bay, are declining. It is likely the additional income from these projects would offset the loss of income from fields that are declining or have reached abandonment. While this income would be positive and beneficial, and would likely help maintain the current level of government activity and capital expenditure, it is unlikely to create a significant change in the growth rate of the communities on the North Slope.

III. DESCRIPTIONS OF LISTED EIDERS OCCURRING IN THE NORTHWEST NPR-A

III.A. Spectacled Eider

III.A.1 Population Status

The spectacled eider was listed as a threatened species in May 1993 (58 [*FR*] 27474) because of significant declines in the North American breeding population, particularly on the Yukon-Kuskokwim (Y-K) Delta. From the early 1970's to the early 1990's, numbers of pairs on the Y-K Delta declined by 96% 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 2002 ranged from a high of almost 9,300 in 1993 to a low of 5,800 birds in 1996 and back up to 6,662 birds in 2002 (Larned et al. 2001a; Larned, Stehn, and Platte, 2003). A minimum (uncorrected for detection bias) long-term average (1992-2002) of 6,896 spectacled eiders occupied the surveyed portion of the ACP of Alaska (Larned. Stehn, and Platte, 2003), about 2% of the estimated 375,000 world population (Larned and Tiplady, 1999; USDOI, FWS, 1999). Most of the world population breeds in arctic Russia. Nonbreeders are not included in the Alaska estimate. They are assumed to remain at sea throughout the year until they attempt to breed at 2-3 years. The size of this population segment is unknown, as is their location during this period. Available life-history information for this species indicates they are long lived with relatively high adult survival and delayed sexual maturity. The Eider Survey area population has shown a nonsignificant decreasing trend of about -1.26% (slope) from 1993-2002 with a corresponding mean growth rate of 0.99 (Larned, Stehn, and Platte, 2003). Additional details of population status and annual cycle may be found in Petersen et al., (2000) and USDOI, FWS (1999a).

III.A.2. Spring Migration

Routes traveled by spectacled eiders during spring migration are not well known. Generally, they have been recorded passing Point Barrow and/or arriving at the breeding areas in late May to early June (Johnson and Herter, 1989). Although leads are important for many species migrating in this region, few spectacled eiders have been recorded using the lead system 5-6 kilometers offshore extending eastward from Point Barrow (Suydam, pers. commun., as cited in TERA, 1999; Woodby and Divoky, 1982). Suydam et al. (1997) recorded 55 spectacled eiders among 213,477 king and common eiders passing Point Barrow in spring 1994. Low numbers (0.5-0.7 birds per hour) have been recorded at several points in Simpson Lagoon (Johnson and Richardson, 1981), but some of these probably were movements of local

birds rather than migrants. Thus, because relatively few spectacled eiders are seen in marine areas, spring migration may be primarily overland from the Chukchi Sea (TERA, 1999). Local observations that spectacled eiders flew inland north of Wainwright, reported by Myres (1958), support this view. They arrive on the breeding areas paired, often traveling in small flocks in late May and early June. Spectacled eiders have been observed to fly generally at altitudes less than 50 meters when over (marine) water (Petersen, Grand, and Dau, 2000).

III.A.3 Nesting

Currently, primary nesting grounds are the Y-K Delta; the ACP (Cape Simpson to the Sagavanirktok River) of Alaska; and in the Chaun Gulf and the Kolyma, Indigirka, and Yana river deltas of arctic Russia. With the exception of a few scattered areas in the northwest NPR-A, spectacled eiders occur at low density on the ACP (Larned et al., 2001b; Larned et al., 2001a; Ritchie and King, 2002). The highest densities determined from FWS aerial surveys in 1998-2001 were found within 70 kilometers of the coast between Barrow and Wainwright, with smaller areas northeast of Teshekpuk Lake (USDOI, BLM and MMS, In prep.:Map 62). Overall density was determined to be 0.24 birds per square kilometer in the Eider Survey area, based on observations of 304 birds in 2001 (Larned et al., 2001a; Larned, Platte, and Stehn, 2001), and 0.22 in 2002 (Larned, Stehn, and Platte, 2003). Before nesting, eiders occupy a variety of wetland and aquatic habitats (Anderson, Stickney, and Ritchie, 1996). Available information suggests female spectacled eiders return to the vicinity of previous nests. Spectacled eiders are dispersed nesters (Derksen, Rothe, and Eldridge, 1981; Warnock and Troy, 1992), occurring at a low density of 0.03-0.79 birds per square kilometer (Larned and Balogh, 1997) within about 70 kilometers of the coast. Higher density nesting and broodrearing areas occur south of Peard Bay, including the Kugrua and Kungok river drainages; south of Barrow; and adjacent to Dease Inlet, including the Meade, Chip, and Inaru river drainages. Tundra-nesting habitat most often includes extensive wetlands (large shallow lakes, lake-basin wetland complexes) with emergent sedges and grasses and vegetated islands (Larned and Balogh, 1997; Stickney and Ritchie, 1996). On the Colville delta, nearly half of the nests located were in salt-killed tundra and aquatic sedge with deep polygons (ABR, Inc., 2002). On the ACP, nesting begins in mid-June. Incubation lasts 20-25 days (Dau 1974, Kondratev and Zadorina 1992, Harwood and Moran 1993, Moran and Harwood 1994, Moran 1995), and eggs hatch from mid- to late July (Warnock and Troy, 1992). Broodrearing in the central ACP occurs primarily in waterbodies with margins of emergent grasses and sedges, basin wetlands, and deeper lakes (ARCO Alaska, Inc., 1996). Fledging occurs approximately 50 days posthatch.

On the nesting grounds, spectacled eiders occupy terrestrial wetlands and feed primarily by dabbling in shallow freshwater or brackish ponds, or on flooded tundra (Dau 1974, Kistchinski and Flint 1974). Food items include mollusks; insect larvae such as craneflies, trichopterans, and chironomids; small, freshwater crustaceans; and plants or seeds (Cottam 1939, Dau 1974, Kistchinski and Flint 1974, Kondratev and Zadorina 1992; Petersen, Grand, and Dau, 2000).

III.A.4. Postnesting Period

Most male spectacled eiders depart the nesting areas from early June to early July (median date June 22 ±11 days) typically soon after females begin incubating. The number of pairs peaks in mid-June, and the number of males declines 4-5 days later (Anderson and Cooper, 1994; Anderson et al., 1995; Smith et al., 1994). Males migrate a median distance of 6.6 kilometers (average 10.1 kilometers) offshore, spending up to a week in marine waters (Petersen, Larned, and Douglas, 1999). Locations of satellite-transmitter-equipped males (Petersen, Douglas, and Mulcahy, 1995) in the Beaufort Sea have been primarily in the western Harrison Bay and western Simpson Lagoon areas (USDOI, BLM and MMS, In prep.:Map 63). A molt migration is undertaken to Ledyard Bay molting area along the Chukchi Sea coast southwest of Point Lay (Larned, Balogh, and Petersen, 1995), and flocks of molting and staging eiders have been observed in Peard Bay, Norton Sound, south of St. Lawrence Island, and the Russian Far East prior to moving to the Bering Sea wintering area from October to December. Initial locations for many of the birds that were

captured initially in the Prudhoe Bay area have been in the Chukchi Sea, suggesting they migrated overland or occupied the Beaufort Sea only briefly (TERA, 1999). Although most males may make relatively little use of the Beaufort Sea prior to their molt-migration, at least in part due to the existence of little open-water habitat this early in the summer (TERA, 1999), for some individuals the Beaufort Sea may be an important staging and migration route for as much as a week or two (Petersen, Larned, and Douglas, 1999).

After nesting, most spectacled eider females with broods occupy coastal plain lakes with emergent grasses and sedges, or deep, open-water lakes. Departure from broodrearing sites for marine areas takes place on average August 29 (±10.5 days). However, departure of females takes place over an extended period from the third week of June through September, because females that fail to breed leave the nesting area early, those that lose their nests leave somewhat later, and those that lose broods leave still later (TERA, 1999). When females depart the ACP, much more of the nearshore zone is ice free than when males depart; this open water in marine habitat allows extensive use of the western Beaufort Sea. Locations of females equipped with satellite transmitters in the Prudhoe Bay area indicate they stage and migrate in the Beaufort Sea and, like some males, use Smith and Harrison bays. Aerial surveys in late August 1999 recorded four spectacled eiders, a female with two young and an individual of unspecified sex in western Harrison Bay (Stehn and Platte, 2000). In 2000, 13 female spectacled eiders tracked via satellite telemetry primarily used the western Beaufort (71% of all bird-days); however, areas near Stockton Island also were used extensively (17% of all bird-days) (Troy, 2003). Half the tagged Prudhoe females were relocated twice in the Beaufort Sea, indicating a residence time of at least 4 days. Most previously were thought to spend relatively little time in the Beaufort (TERA, 1999); however, these recent satellite-transmitter locations suggest they may remain in the Beaufort Sea for about 2 weeks (range 6-30 days; Troy, 2003). Although satellite-tagged females have been relocated more than 40 kilometers offshore in the Beaufort Sea (TERA, 1999), the median distance for migrating individuals is 16.5 kilometers offshore (average 21.8 kilometers) (Petersen, Larned, and Douglas, 1999).

Numbers of spectacled eiders staging in the Beaufort Sea before southward migration generally are unknown. It is likely that relatively few birds occupy this area at any given time. This is suggested by relatively low numbers of birds counted on offshore aerial surveys (estimated densities of 0.01-0.16 birds per square kilometer) (Fischer, 2001; Stehn and Platte, 2000), as well as by the relatively low proportion of initial and repeat locations in the Beaufort Sea (once movement of an individual began) of transmitter-equipped birds that were captured initially in the central Beaufort Sea area. Aerial surveys in the central Beaufort Sea in July 2000 located 143 eiders in the deeper waters of Harrison Bay, including one flock of 100 birds (Fischer, Tiplady, and Larned, 2002). A less intensive FWS survey (flight lines twice as far apart), covering the entire Beaufort coastline from Point Barrow to Demarcation Point in July 2001, located 15 spectacled eiders off western Simpson Lagoon, in outer Smith Bay, and off the Plover Islands east of Point Barrow (Fischer, 2002; USDOI, BLM and MMS, In prep.:Map 62). These studies suggest that relatively low numbers of spectacled eiders typically would be expected to be found in either Beaufort or Chukchi seas during the staging/migration period from late June to September. However, these observations may underestimate numbers, because the limited aerial surveys may not accurately assess use of the entire area, and a substantial proportion of the "unidentified" eiders may have been spectacled. Observations made offshore in the Beaufort Sea by Divoky (1984) suggested that larger flocks may contain hundreds of individuals of this species. Divoky found the largest sitting flocks to contain more than 100 birds and flying flocks more than 300 individuals. During a late June-early July aerial survey in the Chukchi Sea between Peard Bay and Smith Bay, Dau and Anderson (2001) observed 40 spectacled eiders in nearshore waters. In 2002, they observed 10 in this area (Dau and Anderson, 2001), and Dau and Hodges (2003) observed 1 in 2003.

III.A.5 Nonbreeding Season

During the nonbreeding season the only known spectacled eider wintering area, from October/December to April, is among leads in the pack ice southwest of St. Lawrence Island in the Bering Sea (Petersen et al., 1999; Larned et al., 1997). Eiders forage there principally by diving to obtain benthic invertebrates at varying depths less than 80 meters. In the marine environment, they feed primarily on clams but also feed

on snails, a variety of crustaceans, and members of various other taxa (Petersen, Grand, and Dau, 2000). In recent studies in the northern Bering Sea wintering area, esophagi of sampled eiders contained only clams, mostly *Nuculana radiata*, with no trace of the once-dominant *Macoma calcarea* (Lovvorn et al., 2003). Changes in density of the latter species in the Bering Sea were coincident with an oceanic regime shift to warmer conditions. Climate change at northern latitudes and associated changes in marine invertebrate communities and ice dynamics in spring may have had important impacts on the spectacled eider population whose declines of 90% or more in western Alaska essentially are unexplained.

Because few 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 1999). Although their location during the 1- to 2-month period between departure from the wintering area (April) and arrival in breeding areas in early June is unknown, it probably includes leads and polynyas nearest to the breeding areas (Lovvorn et al., 2003).

III.A.6. Factors Affecting Population Status

Factors known or suspected to affect survival of spectacled eiders have been identified, but 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 Y-K Delta has been confirmed to cause mortality of eiders that ingested lead shot. Spent shot pellets are ingested as grit or are accidentally ingested by eiders foraging in sediments for food. The grinding action of the eider's gizzard, in combination with the acidic environment of its digestive tract, causes toxic lead salts to be released into the body. On the Y-K Delta's lower Kashunuk River drainage, the proportion of spectacled eiders that contained lead shot in their gizzards is high (11.6%, n=112) compared to other waterfowl in the lower 48 states from 1938-1954 (8.7%, n=5088) and from 1977-1979 (8.0%, n=12,880). The lead-exposure rate in spectacled eiders (based on x-rays) is likely biased low (Flint, Petersen, and Grand, 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, Havera, and Montgomery, 1987). Blood analyses of spectacled eiders indicate elevated levels of lead in 13% of prenesting females, 25.3% of females during hatch, and 35.8% during broodrearing. Nine of 43 spectacled eider broods (20.9%) contained one or more ducklings exposed to lead by 30 days after hatch (Flint, Petersen, and Grand, 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 also occurs in small, localized hunting areas on the North Slope; but 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*). On Kigigak Island in the Y-K Delta, nest success ranged from 20-95% 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. Native elders on the North Slope believe that fox numbers have increased in recent decades as a result of reduced trapping; this could have an important effect on rates of eider predation. Population sizes of large gulls on the North Slope may have increased as a result of increased food supplies from anthropogenic wastes (Larned et al., 2002). 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. Alaskan Natives have traditionally harvested eiders and their eggs in coastal

villages during spring and fall. Subsistence-harvest surveys for the North Slope indicate that an average of 155 spectacled eiders were taken at Wainwright for 1988-1989, and only 2 spectacled eiders were reported taken at Barrow in 1987-1990 (Braund, 1993). Yup'ik Eskimos on the Y-K Delta have traditionally harvested spectacled eiders for subsistence purposes (Klein, 1966). Although the human population on the Y-K Delta has grown substantially, changes in the number of active hunters are unknown. Similarly, available harvest technologies have become increasingly efficient, but the actual effects of new technologies on harvest levels are unknown. The estimated harvest of spectacled eiders on the Y-K Delta from 1992-1995 averaged 272 birds per year (Service, 1996, unpublished data); the 1992-2001 average is 123 (Service, 2002, unpublished data).

There are other sources of take such as avicultural egg collecting (until 1991), research activity, and loss of habitat in growing communities and oil fields. Their overall impact on 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.

III.B. Steller's Eider

The Alaska-breeding population of Steller's eider was listed as threatened on June 11, 1997 (62 *FR* 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: western Alaska where the species has been nearly extirpated, and the ACP where the species still occurs. In western Alaska, Steller's eiders occurred primarily in the coastal fringe of the Y-K Delta where the species was common at some sites in the 1920's, was still present in the 1960's, but was not recorded as breeding from 1976-1994 (Kertell, 1991; Flint and Herzog, 1999). In 1994 and 1996-1998, one to two nests were found at either or both the Tutakoke River and Hock Slough study sites on the Y-K Delta (Flint and Herzog, 1999).

On the ACP, Steller's eiders historically occurred from Wainwright east, nearly to the United States-Canada border (Brooks, 1915). The species may have abandoned the eastern ACP in recent decades, but it still occurs at low densities (0.01 per square kilometer; Larned et al., 2001; Larned, Stehn and Platte, 2003) from Wainwright to at least as far east as Prudhoe Bay (USDOI, BLM and MMS, In prep.:Map 63). The majority of sightings in the last decade have occurred east of Point Lay, west of Nuiqsut, and within 90 kilometers (56 miles) of the coast (Barrow Triangle). Near Barrow, Steller's eiders still occur regularly, although they do not nest annually. In some years, up to several dozen pairs may breed in a few square kilometers. The species has been found at highest density (0-3.0 pairs per square kilometer) during road surveys in the core nesting area near Barrow (Quakenbush, et al., 1995; USDOI, FWS, 1999). Intensive surveys in the area between Admiralty Bay and the Chukchi Sea from 1999-2001 recorded densities of 0.02-0.08 birds per square kilometer (44-112 birds observed during 3 years) (Ritchie and King, 2002). In 2002 and 2003, respectively, these investigators recorded an indicated total of 4 birds and 8 birds and a density of less than 0.01 birds per square kilometer (Ritchie and King, 2003; Ritchie, 2003, pers. commun.).

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 1993-2001 (Larned et al., 2001a). 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 ACP. 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% change over 10 years (Larned et al. 2001b). 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 and have reduced their breeding frequency in eastern portions of the ACP; if true, this likely indicates that the Alaska breeding population is in decline (Quakenbush et al., 2002).

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, nearshore 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, Butler, and Balogh, 1994).

Steller's eiders arrive paired on the ACP in early June. Nesting effort varies widely from year to year. In the 12 years from 1991-2002, there were 6 "nesting years" (1991, 1993, 1995, 1996, 1999, 2000) when typical breeding activities occurred, and 6 "non-nesting years" (1992, 1994, 1998, 2001, 2002) 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 also has 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 five 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% 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, Martin, and Suydam, 2001). The fledging period is not known, but is estimated to be 37 days (Obritschkewitsch, Martin, and Suydam, 2001). Broods most often used ponds with emergent grass (*Arctophila fulva*) (Quakenbush et al., 1998). Broods were reared close to their nest site; eight broods tracked near Barrow in 1995 remained within 650 meters 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, Martin, and Suydam, 2001). Both males and females tracked with satellite transmitters in a nonbreeding 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 (fewer than 10) have been observed in July near Barrow (USFWS, 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 St. 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 (USFWS, 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 ingestion of lead shot.

III.C. Critical Habitat

The FWS designated approximately 101,000 square kilometers (38,992 square miles) on the Y-K Delta and in Norton Sound, Ledyard Bay, and the Bering Sea between St. Matthew and St. Lawrence Islands as critical habitat for the spectacled and Steller's eiders, on February 2 and February 6, 2001, respectively (66 *FR* 8850 and 9146). The only area designated in the Arctic is Ledyard Bay, a spectacled eider molting area in the southeast Chukchi Sea, northwest of Cape Lisburne and south of Point Lay, and the westernmost portion of the Northwest NPR-A Planning Area. The Bering Sea marine area, the only known wintering area for spectacled eiders (Petersen, Larned, and Douglas, 1999), includes organisms in the water column and the underlying bottom community where these bottom-feeding ducks forage in depths of at least 70 meters (Petersen, Piatt, and Trust, 1998).

IV. ASSESSMENT OF EFFECTS ON LISTED EIDERS

IV.A. Effects from Non-Oil and Gas Activities

Subsistence harvesting of spectacled and Steller's eiders is continuing across the North Slope (USDOI, FWS, 2002). Efforts currently are under way by both FWS and the North Slope Borough to inform subsistence hunters of harvest closures in an effort to decrease this source of mortality. This type of harvest is most pronounced in the immediate area of villages. It is not known what the overall impact this activity has on either species of eider.

Lead-shot contamination (nontargeted, but residual effect of general waterfowl hunting) of spectacled and Steller's eiders has been documented near Barrow, and the Y-K Delta (USDOI, FWS, 2002); however, the extent of this contamination is not defined at this time.

The National Marine Fisheries Service (2002) reported that within the marine range of the Steller's eiders, the marine environment likely has been affected by human activities including commercial-fishing, marine-transport, and environmental pollutants. However the FWS (66 *FR* 8850) has no evidence that modification of the marine environment has contributed to Steller's eider decline. Naturally occurring ecosystem changes also may result in a decline in available food supply for Steller's eiders (National Marine Fisheries Service 2002), but the extent is not known.

Human population growth (unrelated to oil development) around villages and the regional hub of Barrow leads to some nesting habitat loss for Steller's eiders in expansion of housing areas into previously open areas (Quakenbush and Suydam, 1999). This habitat loss, and related human activity also may lead to increases in predator populations (ravens, gulls, foxes, etc.) (National Marine Fisheries Service, 1993).

IV.A.1. Effects of Ground Activities

Most ground transport activities occur in winter and thus would not disturb eiders or affect their habitats. However, during the summer breeding season, noise and visual presence of humans resulting from various activities may disturb eiders. Eiders are likely to be displaced from within about 0.2-1.0 kilometers of large summer encampments, potentially causing a local decline in nest attempts and success (Grubb et al., 1992; Johnson et al., 2003; Murphy and Anderson, 1993; Skagen, Knight, and Orians, 1991; Stalmaster and Newman, 1978). Under the Preferred Alternative, occupation of large research or inventory camps is anticipated to be 12 weeks (Table IV-28). Eiders displaced when a camp is initially occupied would not be likely to return to the area after such camps are abandoned because of a short breeding/rearing season in the Arctic. Lack of male availability at the end of these periods also would limit success. Local spectacled eider populations may experience minor declines in breeding success due to disturbance in summers when camps are occupied. This scenario may not be as relevant to Steller's eiders, because they are distributed

more sparsely within the Planning Area than spectacled eiders, and their attempts at nesting appear more sporadic.

Predators attracted to camps may decrease breeding success of local nesting eiders. Effects of small, frequently moved camps are likely to be negligible (Table IV-28) but may result in minor, localized loss of nest success and productivity. Small groups of travelers on the Colville and other rivers at the frequency anticipated are expected to cause negligible disturbance of eiders.

IV.A.2. Effects of Aircraft

Both fixed-wing aircraft and helicopters could be used to transport personnel, supplies, and equipment into summer field camps and to conduct aerial surveys. Helicopter activity has a potential to cause substantial disturbance of eiders, although Balogh (1997) indicated that fixed-wing aircraft flown at 150 feet often caused spectacled eiders to flush, while helicopters flown at similar altitudes in the vicinity of Prudhoe Bay did not. Behavioral reactions of prenesting birds to aircraft overflights may not be representative of behavior of incubating or broodrearing birds. It is possible that some eiders may be disturbed by these activities and experience temporary, nonlethal effects. Effects of routine aircraft flights into large camps may range from causing avoidance of certain areas by eiders to abandonment of nesting attempts or lowered survival of young. Regardless of where they originate, such flights may pass over areas where eiders occur at higher density. There is a potential for displacement of some nesting eiders near routinely used aircraft landing sites as a result of numerous overflights, landings, and takeoffs. However, although the reaction of eiders to aircraft overflights is unknown, there is a potential for habituation to routine air traffic by spectacled eiders. In the Prudhoe Bay area, nests are located regularly in wetlands within 1 kilometer of the Deadhorse Airport (TERA, 1995), including one less than 250 meters from the runway (Martin, 1997), suggesting that some nesting individuals are tolerant of aircraft activity.

Low-level (less than 500 feet aboveground level) aerial survey flights for monitoring bird or caribou populations have an unknown effect on eiders. In general, however, disturbance of a particular area is of short duration, and surveys cover only a small percentage of the Planning Area each season. It is anticipated such flights would cause negligible disturbance of eiders. In the northeastern portion of the NW NPR-A Planning Area, wildlife survey activity may be more frequent during a 3-week period in June and July (Table IV-28), thus disturbing larger areas or certain areas more intensively than elsewhere in the Planning Area. Eiders may be disturbed by helicopters used for studies in which caribou are captured for attachment of radio collars. Other aerial surveys and point-to-point air traffic are likely to cover a small percentage of the Planning Area. Relatively few nest sites are expected to be affected, because eider nest sites generally are scattered at relatively low density over much of the northern half and west-central portion of the Planning Area, and at even lower density in the remainder. In most areas, aircraft effects are likely to be short-term and negligible, although potentially minor effects could occur in the vicinity of large camps located in eider higher density areas. Quantitative effects resulting from aircraft activity are difficult to separate from natural variation in population numbers.

IV.B. Effects from Oil and Gas Leasing and Exploration

Under the Preferred Alternative, all BLM-administered lands in the Planning Area would be available for leasing. However, leases in the proposed Deferral Area (17 % of the Planning Area) would not be offered for at least 10 years following the Record of Decision for the NW NPR-A IA/EIS. Seismic surveys could occur anywhere in the Planning Area during any winter, depending on the interests of the oil industry and approval by BLM. Exploration drilling would occur only where oil/gas leases are purchased. It currently is unknown where these activities would occur, but it is assumed industry would focus primarily on the area of high potential (Map 105). This discussion of potential effects is based on levels of activities considered reasonably foreseeable (see Section II).

Spectacled eiders are widely distributed throughout the ACP portion of the Planning Areas during summer months but are absent from the areas from October to May, when most oil exploration would occur.

Steller's eiders are widely scattered in low numbers over most of the ACP portion of the Planning Area in summer, with an area of higher concentration south of Barrow between Dease Inlet and the Chukchi Sea. Human presence and associated noise and activities (including aircraft and marine vessel traffic) may disturb both species of eider.

IV.B.1. Seismic Surveys and Exploration Drilling

Seismic surveys and exploration drilling would occur in winter (generally December to May) when eiders would be absent; thus, no direct impact to eiders would occur. There would be no disturbance effect on breeding eiders or risk of eider mortality due to collision with structures. All garbage from these operations would be removed to existing Borough landfills, sometimes after being incinerated on site. This would preclude the attraction of predators that otherwise may linger in the area until after eiders arrive in early summer. With the exception of a blowout occurring during exploration drilling (for such an unlikely event, it is assumed none would occur [USDOI, BLM and MMS, In prep. Table IV-7]), any spills would be refined petroleum products or antifreeze and would be site contained. In a frozen environment, such spills would be cleaned up immediately to a level that would have no effect on eiders the following summer. Ice roads, built to support exploration activities, may increase access to an area for subsistence hunters in the winter but would have no effect on increased access during summer months.

Indirect impacts on eiders could occur in summer as a result of winter exploration activities. Each seismic operation is prepared for summer storage on an existing gravel pad as near the previous winter's operation area, and the presumed area for continued operations the following winter, as possible. Exploration drill rigs would be moved at the end of the winter season either to an existing gravel pad and cold stacked, or cold stacked on a special ice pad designed to last throughout the summer into the next winter. Some negligible disturbance to eiders could occur from aircraft travel to these sites in summer, but the frequency of these flights (see Section II) would be low compared to other areas where impacts of air traffic have been studied (Johnson et al., 2003; Martin, 1977). The presence of maintenance personnel at the seismic camps in summer may cause some disturbance to eiders in the immediate vicinity of the gravel pad and, in the worst case, result in nest failure. However, only two such camps are reasonably foreseeable, and their footprint is small; they are expected to have a negligible effect on eiders.

Cold-stacked exploration drill rigs have a low profile (20 feet or less in height) and have a small footprint. It is unlikely the storage of this equipment would cause eider mortality due to in-flight collision. Predators would not be attracted to garbage at these cold-stack facilities, because all garbage is removed from the sites to approved Borough landfills. Any petroleum or chemical spill related to maintenance activities would be confined to the site and would not pose a threat to eiders. Cold stacking of equipment would provide no increased access for subsistence hunters.

Winter exploration activities and summer storage of a drill rig on an ice pad (5-6 acres) may alter habitats temporarily (e.g., compression of standing-dead vegetation, or delayed pheneology of vegetation due to late ice melt). This could affect the distribution of eiders occurring in or adjacent to the Planning Area in subsequent summer seasons. Impacts to vegetation are low overall (Jorgenson. Reitz, and Raynolds, 1996) and especially in wetter habitat that eiders frequent. Only a small portion of the tundra within the Planning Area is affected during any particular year, and eider habitat does not appear to be the limiting factor in population decrease. Overall, the impacts on eiders from summer storage of equipment on ice pads would be limited to possible short-term displacement and would have no measurable impact to eider populations.

The construction of ice roads in support of winter exploration drilling activities involves the withdrawal of millions of gallons of water from adjacent deepwater lakes. The effect, if any, of this withdrawal on invertebrate fauna in these lakes are unknown, but recent studies of water-level changes during and after winter water withdrawal have failed to show measurable change. The withdrawal of water from these deepwater lakes would not have an effect on eider population, because neither species selects deepwater lakes as their preferred habitat (USDOI, BLM, 2002).

IV.B.2. Marine Vessel and Aircraft Activity

During the summer open-water season (mid-July to early October), there could be some marine transportation of equipment and supplies needed for exploration. Barges may be used for transport because of logistic and economic issues associated with moving heavy equipment and materials, either by ice road or rolligon, over the long distances from current infrastructure. During the exploration phase, barges likely would be the preferred transport for exploration drilling rigs. If suitable staging areas do not already exist, new ones may be established along the coastline and materials transported and stockpiled for use at inland sites during winter operations. Vessel traffic generally would be limited to routes in shallow, nearshore, waters between staging areas connected to existing infrastructure (e.g., West Dock or Oliktok Point) and staging areas along the coastline in the Planning Area at Cape Simpson or Barrow. Spectacled and Steller's eiders that are accompanying young, or staging and migrating in coastal or offshore waters during the variable periods they are present in the Beaufort Sea (males and non-breeding females: late June/early July; failed nesting females: July-September; or females with juveniles: late August/September), could encounter vessels associated with oil and gas activities in the Planning Area. Because these birds are likely to dive or fly short distances to avoid close approach of vessels, there would be negligible disruption of foraging activity or rest periods because of the low probability of interactions with vessel movement.

Aircraft activity over the marine environment during the open-water season, as a result of exploration activities in the Planning Area, is expected to be minimal. There is a low probability these areas would be overflown by support aircraft during the brief staging/migration periods; thus, no consequential disruption of foraging or resting behavior caused by aircraft are expected.

IV.C. Effects from Oil and Gas Development and Production

IV.C.1. Habitat Loss

IV.C.1.a. Permanent Habitat Loss

Gravel mining operations most likely would be located on river drainages within the Planning Area. Depending on location and extent of each material site, overall effects could range from no eider habitat disturbed to a worst-case scenario eliminating up to 280 acres of known habitat (Table 1, Section II.C.2). Potential losses of habitat may include areas used during the entire period eiders are present in the Planning Area (prenesting, nesting, broodrearing, and molting). To eliminate eider habitat loss due to gravel mining, all such operations would have to occur outside the areas used by eiders during any portion of their stay in the Planning Area, which is unlikely. The actual location and extent of the gravel mining operations is unknown at this time. Gravel would be mined and transported to sites via ice roads during the winter when eiders are absent, so no affects would be incurred by eiders. Because no active mining would occur at sites during the time when eiders are present in the Planning Area, no zone of influence analysis is provided.

The actual gravel footprint needed for development of anchor and satellite facilities (including associated roads), a roadless pump station, and a staging areas would total 1,420 acres (Table 1). Areas covered by gravel are effectively eliminated as productive breeding and foraging habitats for wildlife, and this loss is considered permanent. Placement of gravel fill has a substantial impact on wildlife habitats in the Arctic, as the disturbance is long term and recovery of vegetation is slow (Johnson, 1987; Walker et al., 1987; Jorgenson et al., 1991). The ratio of eider habitat that would be lost to gravel placement and total eider habitat available in the Planning Area is unknown at this time, because neither the actual location of gravel placement nor the amount of eider habitat present in the Planning Area is known. It is reasonable to assume that within the Planning Area, there is sufficient eider habitat available for individual eiders displaced by gravel placement relocate successfully to other areas. A study by Troy and Carpenter (1990) found that in the Prudhoe Bay oil field, most birds (particularly shorebirds) that are displaced by gravel

placement will nest in adjacent habitats in subsequent years. Spectacled eiders have been found to nest in the same general areas from year to year, but they do not always return to the same nest site (Johnson, 1995). Anderson et al. (2002) have located spectacled eiders nesting near roads and pads in some oil fields on the North Slope. Information of use of areas near oil field facilities is not available for Steller's eiders. When the total area of gravel fill is compared to the total acreage within the Planning Area and the apparent ability of spectacled eiders and other birds to relocate nests annually, the direct effects of gravel fill on spectacled and Steller's eiders is expected to be minor.

IV.C.1.b. Temporary Habitat Loss

Alteration of nesting habitat that results in its temporary loss could be caused by delayed snowmelt and compaction of vegetation in areas underlying ice roads used for transport of equipment and material for seismic surveys and snow dumps around pads during winter. Ice roads and associated snowdrifts may not melt before eiders begin nesting, thereby reducing the availability of nest sites. Compaction of standing-dead vegetation from previous growing seasons could degrade or eliminate concealing cover potentially used by eiders. Such temporary losses may adversely affect eiders, because they traditionally return to the same general nest area each year. Such effects could be compounded if ice roads cross the same area more than once. Efforts to decrease the compaction of vegetation could include routing ice roads over areas of nearshore ice, lakes, tidal flats, rivers, and streams to avoid damaging vegetation; altering the route of ice roads annually to avoid possible compounding the effects of compaction; and avoiding routing the ice roads over areas of known eider concentrations. Other temporary effects to habitat alter the patterns of use in an area. Habitats adjacent to oil field infrastructure (anchor and satellite pads, roads, staging area, etc.) would be affected by dust fallout, persistent snowdrifts, impoundments, thermokarst, and water withdrawal that would occur during the development and productions phases. These effects have the potential to alter use of these habitats by eiders. The magnitude of these impacts would depend on a variety of factors including habitat type, volume of ground ice, and local hydrology (Brown and Grave, 1979; Walker et al., 1987). The total area affected would be between 21,610 and 53,960 acres depending on the area of the zone of influence chosen.

The magnitude of effects from dust fallout would depend primarily on the intensity of vehicle traffic and aircraft takeoffs and landings and primarily would cause snowmelt in advance of surrounding areas, thermokarst, increased depth of seasonal thaw, increased soil pH, lower nutrient levels, and changes in the species composition of plant communities. Dust fallout would be expected to be greatest during the construction phase and would be reduced during the operational phase of the project. Advanced snowmelt due to the thermal properties of dust fallout on snow can have both positive and negative effects on eiders. Areas that are available early in the season will provide early access to open water and foraging areas. These areas, however, will be close to roads, airstrips, and pads, providing increased potential for collisions and vehicle strikes. Restricting the bulk of construction to the winter months, applying dust-control procedures, and reducing traffic of all types to a minimum should reduce dust fallout to a minimum level.

The magnitude of the effects of thermokarst (melting of permafrost) is directly related to the type and amount of disturbance to the tundra. The effects are caused primarily by alteration of the hydrologic regime in the area and include both positive and negative impacts to eiders. Murphy and Anderson (1993) found that waterfowl used an area disturbed by the building of a peat road more often than most other undisturbed habitats in Prudhoe Bay. Changes in the hydrologic regime of an area could cause impounding of water and loss of eider nesting habitat due to flooding. There are very little data available from which to draw conclusions about the impacts of thermokarst on eider habitat. The proportion of the Planning Area that would be impacted by thermokarst due to removal or alteration of the tundra would be small; thus, the impacts to eiders would be expected to be minor.

The construction of gravel roads, pads, and airstrips can cause changes in the hydrologic regime of an area and can result in impoundments. Impoundments can have both positive and negative effects on eiders. Positive effects include earlier access to ice-free areas due to impoundments being in areas near roads and pads, which often thaw earlier (Anderson et al., 2001). Impoundments also can preclude nesting by flooding of potential nesting habitat (Walker et al., 1987). Just as with thermokarst, the effects of impoundments are not well known in relation to effects on eider habitat. Assuming that eiders experience

both positive and negative effects of impoundments and the relatively small amount of area covered by gravel roads, pads, and airstrips in the development plan, only minor impacts to eiders would result.

Withdrawal of water from lakes potentially could affect eiders due to alteration of hydrologic regimes resulting in reduced availability of nest sites. Small islands in lakes and areas of slightly raised tundra in wetlands are used by eiders for nesting, because they provide some protection from predators by virtue of being across an expanse of water. If the volume of water withdrawn is great enough, these island habitats would cease to exist and predators would have easier access to eider nests. Water withdrawal from lakes is regulated by ROP B-2, which was written primarily for the preservation of fish habitat but also would protect eider habitat by restricting the volume of water removed. Water withdrawal has potential serious effects on eider habitat availability and nest success. Large lakes often are chosen for water withdrawal and, because of their large volume, there often is little effect on the surface level. Water withdrawal often is conducted in winter, because water is need for construction of ice roads. Withdrawal in winter allows for spring breakup to recharge waterbodies. Water withdrawal in summer would have to be carefully monitored to ensure that water is not being removed form waterbodies that support nesting or broodrearing eiders.

IV.C.2. Bird Collision Hazard Related to Oil Development and Production Activities

The presence of drill rigs, production and support facilities, vehicles (trucks and aircraft), barges, and power and communication lines and towers all represent potential collision hazards to eiders. Extended day length during the nesting season suggests that such structures would be quite visible and easily avoided except potentially under conditions of rain or fog. Certain types of structure lighting in common use may amplify any tendency of eiders to approach and strike structures. Various oil and gas structures present collision hazards during low-light conditions; mitigation that requires exterior lights to be directed inward and downward (ROP E-10) may be required. Ongoing studies (ABR, Inc., Northstar Island) are attempting to determine the optimum lighting regime for both human safety and to minimize bird collisions. Close communication and cooperation between BLM, FWS, and oil companies as to the latest developments in lighting would help in continuing to improve lighting regimes to minimize collisions.

IV.C.2.a. Drill Rigs

A maximum of eight development drill rigs would be operating in the Planning Area during the time when eiders are present over a period of 6 years (Table IV-02). Rigs would be located on satellite pads and are approximately 60-80 feet in height when in operation. Drill rigs would occupy a very small proportion of the area occupied by eiders, so the collision hazard is thought to be negligible.

Production and support facilities would be located onshore on gravel pads, and could pose a collision hazard for eiders. Inter-tidal or offshore facilities are unlikely to exist due to the ¾ mile no surface occupancy requirement (Stipulation K-6). Proper lighting of structures during periods of poor visibility may help reduce the potential for collision. These facilities rarely exceed 30 feet in height, and human and vehicle activity around facilities may act as a deterrent to eiders and help to reduce the number of collisions. Number of collisions due to production and support facilities would be expected to be very small.

IV.C.2.b. Aircraft Collision Hazard Related to Oil Development and Production Activities

Aircraft operations present possibilities for collisions with eiders. Each of the two anchor facilities will have an associated airstrip which will be used by fixed-wing aircraft and helicopters. There will be substantial aircraft traffic during the development and a reduced amount during production (see Sections II.C.2.d and II.D.1). The U.S. Department of Agriculture, through an interagency agreement with the

Federal Aviation Administration (FAA), compiles a database of all reported bird/wildlife strikes to U.S. civil aircraft and to foreign carriers experiencing strikes in the USA. More than 38,000 strike reports from 1,300 airports have been compiled for 1990-2001 (about 5,900 strikes in 2000). The FAA estimates that this represents only about 20% of the strikes that have occurred. Aircraft collisions with birds are most prevalent during the takeoff and landing phases of flight, and the consequences of bird/aircraft collisions can be disastrous to both the bird and the occupants of the aircraft. Even though collisions between birds and aircraft occur the probability of a collision with an single eider is considered low, because most collisions are with flocks of birds (U.S. Dept. of Agriculture, Bird Strike Committee, web page 2003), and eider densities are low (1.11 birds/km^2 for spectacled eider and 0.06 birds/km^2 for Steller's eider).

IV.C.2.c. Terrestrial Vehicle Collision Hazard Related to Oil Development and Production Activities

The majority of vehicle traffic would occur in winter during development and would be greatly reduced during the period when eiders are present in the Planning Area. Vehicles would be used for travel between anchor and satellite pads to monitor wells and complete routine maintenance. Information regarding vehicle-caused mortality for the Kuparuk and Prudhoe Bay oil fields is not available, although the actual number of animals injured or killed is thought to be low. The number of eider mortalities from vehicle collisions is expected to be negligible, because the number of eiders in relation to all birds in the area is very small.

IV.C.2.d. Marine Vehicle Collision Hazard Related to Oil Development and Production

Spectacled and Steller's eiders that are accompanying young, or are staging or migrating in coastal or offshore waters during the staging/migration periods (late June/early July, late August/September), may encounter a few vessels associated with oil and gas activities in the Planning Area. Barges delivering equipment late in the open-water season may represent a potential collision hazard for eiders. One such case was documented in March 2001, when three spectacled eiders struck a research vessel in the northern Bering Sea wintering area under predawn light conditions (Lovvorn et al., 2003). The number of barges potentially using the area is so low (assumed up to 20) compared to the open-water area available for eiders that the potential for collisions from this source are considered to be very low.

IV.C.2.e. Power and Communication Structure Collision Hazard Related to Oil Development and Production

Power and communication lines will be buried in roads or installed on the pipeline VSM's. The combination of power and communication lines with the pipeline would present a single large, easy to detect obstacle potentially reducing the risk of collisions as compared to traditional communication and power lines strung on poles. Power and communication lines buried under the road would reduce potential collisions from these structures to zero. Studies conducted in the Lisburne Development Area showed that bird collisions with power lines were infrequent (Anderson and Murphy, 1988). Eiders likely would make up only a small component of these types of collisions, because they make up only a small proportion of the total number of birds in the area. Each anchor facility will have one communication tower, which may be up to 60 feet in height. All guy wires on communication towers would by marked (ROP E-11) to increase visibility and reduce the potential of collisions by eiders. It is expected power and communications lines and towers would pose a negligible hazard to eiders.

IV.D. Potential Effects of Increased Accessibility for Subsistence Hunting

IV.D.1. Birds Hunted in Previously Inaccessible Areas

The reasonable and foreseeable scenario depicts oil field developments within the Planning Area as being unconnected to other road systems. Nonetheless, there remains a possibility that the roads within a development may increase the access of local hunters to previously inaccessible areas. These roads would connect the secondary and satellite pads to the main pad of the anchor development. If a development were constructed so that its roads were within reach of the ATV trails extending south out of Barrow, hunters from Barrow might reach the road system of the development and use it for easy, motorized access to areas farther from Barrow. Alternatively, Barrow hunters that previously used the area by whatever means of access may avoid that area once a development is constructed. Some villagers of Nuiqsut say they have reduced their use of the Colville River Delta in the vicinity of the Alpine development since its construction.

Those hunters interested in harvesting waterfowl may be most attracted to this possible increase in access during the period immediately following spring breakup, when some hunters concentrate on geese and other returning birds. Although the FWS has made an effort to educate the local hunting public about the plight of spectacled and Steller's eiders, and has stated that the prohibition against harvest of these species would be enforced, some level of harvest may continue. It is unknown what that level is, or whether the increased access scenario depicted here would result in an increased harvest of spectacled or Steller's eiders in the Planning Area. It would be speculative to state how this would impact the eider populations other than to say there is a potential for an adverse impact.

IV.D.2. Lead-Shot Accumulation in the Environment

It currently is illegal to use lead shot for waterfowl hunting. Its lethal and sublethal effects from ingestion by eiders and other waterfowl are well established (e.g., Flint and Grand, 1997). The FWS and other agencies have made efforts to educate North Slope residents on this issue, and clinics have been held to train local hunters how to adjust to the different ballistics of steel shot. Nonetheless, lead shot remains available in stores in Barrow and other North Slope villages and is still legal for use in hunting upland game such as ptarmigan. Whether through illegal use for waterfowl hunting, or legal use for ptarmigan hunting, use of lead shot could result in distribution of pellets in shallow tundra ponds where eiders could ingest them. If oil field development in the Planning Area were to result in increased access by bird hunters, it may result in an increase in lead-shot pellets in tundra wetlands. It is unknown what effects these possible scenarios would have on eider populations.

IV.E. Potential Effect of Human Activities on Predator Populations

IV.E.1. Known Predators

Potential predators to eiders, eggs, and young in the Planning Area include glaucous gull (*Larus hyperboreus*), common raven (*Corvus corax*), arctic fox (*Alopex lagopus*), red fox (*Vulpes vulpes*), grizzly bear (*Ursus arctos*), and polar bear (*U. maritimus*). Predators are attracted to areas of human activity where they feed on garbage and handouts and use human-made structures for denning, nesting, shelter

sites, and hunting perches. Concentrations of predators in an area due to human-created attractants may cause increased mortality to eiders in the area.

IV.E.2. Effects

Foxes and bears are attracted to areas of human activity where they feed on garbage and use human-made structures for denning (Burgess et al., 1993; Eberhardt et al., 1982; Follmann, 1989; Follmann and Hechtel, 1990; Truett, 1993). Foxes are known to prey on adult waterfowl (likely including eiders), eider eggs, and young; thus, increases in predator populations could have an effect on eider nesting success, productivity, and adult survivorship. Grizzly bears prey on waterfowl eggs and have been know to destroy large numbers of nests in areas of colonial nesting waterfowl species. Polar bears are unlikely to affect eider populations, because they are mostly absent from the Planning area during the period when eiders are present.

It generally is accepted that populations of glaucous gulls and common ravens have increased on the North Slope in response to the availability of food found in areas of human activity. Ravens and some raptors have been found nesting on manmade structures in oil fields, including on elevated pipelines, bridges, and wellheads (Ritchie 1991; BLM unpublished data). They also have been detected using remote wellheads for hunting perches (BLM unpublished data). Glaucous gulls and common ravens prey on eider nests and young; thus, increases in predator populations could have an adverse effect on eider nesting success and productivity.

Required operating procedure A-2 would tend to prevent the attraction of predators to food and garbage, and ROP E-9 was written to prevent human-made structures from being used as nesting, denning, or shelter sites for predators. These two ROP's have the potential to greatly reduce the attraction of eider predators to new areas of human activity and, consequently, greatly reduce potential predation on eiders, eggs, and young. At the Alpine Development, Johnson et al. (2003) found that predator numbers remained stable from preconstruction through construction periods. They also found no clear evidence that predation rates by either foxes or avian predators changed during their study. Strict compliance with required operating procedures and the fact that developments will be small and scattered likely will result in, at most, a small increase in the number of predators attracted to new developments. The greatly reduced potential for attracting predators to new developments would lead to considering impacts of predation to eiders at these new developments to be very minor.

IV.F. Disturbance Related to Oil Development and Production

Activities during development and production may result in disturbance of eiders with effects on behavior and distribution of individuals and abundance of local or regional populations in or adjacent to the Planning Area. Disturbance may cause nest abandonment, increased energy expenditures that affect physiological condition and rate of survival or reproduction, or long-term changes in behavior such as abandonment of traditionally-used areas (Calef, DeBock, and Lortie, 1976). Disturbance factors could include human and vehicle/equipment activity on gravel pads and roads, cleanup of off-pad oil spills, routine maintenance of off-pad structures, and aircraft and watercraft activity.

IV.F.1. Gravel Mining and Transport

The development scenario of the Preferred Alternative assumes that gravel mining and transport will occur during winter when eiders are not present. As such, there would be no eider disturbance effects associated with this activity. Habitat loss is discussed in Section IV.C.1.

IV.F.2. Oil Field Construction

The gravel placement for roads, airstrips, and all pads associated with wells, processing facilities, pump stations, camps, staging areas, etc. would occur during winter when eiders are not present and would represent no disturbance effect. Other activity on these pads during summer is discussed in the following sections. Pipelines would have no gravel road associated with them. Pipelines would be constructed in winter when eiders are absent from the Planning Area. The effects of habitat loss beneath gravel pads are discussed in Section IV.C.1.a.

IV.F.2.a. Summer Oil- and Gas-Related Activity on Gravel Pads and Roads

Activities on gravel pads when eiders are present in the Planning Area include humans on foot, aircraft landings and takeoffs, vehicles, heavy equipment, drill rigs, and facility noise. The gravel pads to which this section refers are those used for drilling, processing, human habitation, pump stations, etc. Roads are discussed in the following section, and airstrips are discussed under effects of aircraft. Little is known about the effects of this movement and noise specific to nesting eiders, but there have been several studies involving disturbance of other bird species in Alaska's North Slope oil fields (Woodward-Clyde Consultants, 1985; Hampton and Joyce, 1985; Troy, 1986, 1988; Anderson, 1992; Anderson et al., 1992; Burgess and Rose, 1993; Murphy and Anderson, 1993; ABR, Inc., 2002; Johnson et al., 2003). Although vehicle traffic may occur on more areas of pads and roads, humans on foot generally cause a greater disturbance to birds. Tolerance of disturbance varies among species and individuals, and some level of acclimation to disturbance is possible.

In the studies referenced above, not all potentially disturbing events resulted in a reaction by observed birds. For geese and swans in one study (Murphy and Anderson, 1993), only about 10% of vehicle passes did so. Most responses by birds to activities on gravel pads occurred relatively close to the pads, for example, within 200 meters for geese and swans. Behaviors exhibited as a result of disturbance included brief alert posture (raised head) and, less frequently, walking, running, or (rarely) flying.

Some anecdotal observations of spectacled eiders have been made during these studies, suggesting that they react similarly to the other waterfowl studied. Anderson et al. (1996) observed prenesting pairs of eiders closer to roads than were nesting females. The latter may be more sensitive to disturbance. However, female eiders with broods have been known to cross roads between nesting and broodrearing habitats (TERA, 1995). In combination, these studies suggest that those eiders that do react to disturbances on pads most likely would do so with short-term changes in behavior. This may cause increased energy expenditures among those birds within 200 meters of pads and roads, subsequently affecting physiological condition and rate of survival. It may be more likely, however, to affect reproductive success. Given the low proportion of reactions to disturbance factors shown by other species, the relatively short distances from facilities at which most reactions occurred, and the low probability of eiders occurring within those distances, any resulting decrease in reproductive success probably would be minor from the perspective of eider populations.

Any potential displacement of eiders (i.e., redistribution with respect to facilities prior to the beginning of nesting) as a result of disturbance is discussed in the following. A potentially more serious situation would exist if eiders were to nest near a gravel pad with no human activity in early summer but an inception of activity later in the nesting season. This scenario is possible at staging areas, where there would be no activity until later in summer when barges can arrive. If this occurs before the young leave the nest, and the activity is great enough and the eider sensitive enough to cause a conflict, it could result in nest failure or abandonment. In this case the result would be a decrease in productivity for the local eider population. Given the low probability that eiders will be nesting near enough to one of the few staging areas in the Planning Area, and in the context of natural nest failure rates, this scenario is unlikely to result in population-level effects.

IV.F.2.b. Other Activity on Roads

The effects of subsistence activity that may make use of oil facility roads are discussed elsewhere in this document. It is not expected that any recreational or tourism use of oil field roads will occur in the NW NPR-A and, therefore, would not affect eiders

IV.F.2.c. Aircraft Activity

Except for one study conducted between 1999 and 2001 at the Alpine Development (Johnson et al., 2003), the effects of air traffic on nesting waterfowl in the Arctic have not been studied. Derksen et al. (1992) conducted a study of the short-term effects of aircraft disturbance on molting brant in the Teshekpuk Lake Special Area, but it is unknown if molting eiders respond to aircraft in a manner similar to brant. Spectacled eiders are known to nest and raise young near the Deadhorse airport, indicating that at least some individuals are tolerant of frequent aircraft noise, including that from multiengine aircraft and helicopters (TERA, 1996). Air traffic is associated with, and is likely to be an important source of, disturbance to eiders in all phases of development and production of a roadless oil field.

Although the exact number of flights that would occur in the Planning Area is not known, we believe that using the aircraft traffic figures from the Alpine Development (Johnson et al., 2000, 2001, 2003) is a reasonable proxy for the roadless development being analyzed here. The figures presented here include all fights as recorded by air traffic control at Alpine, including flights for research purposes. During the nest monitoring period (June 11-July 12), in the 1999 construction year at the Alpine Development, a total of 166 fixed-wing takeoffs and landings were recorded (average of 5.2 takeoffs and landings/day) including DC-6, Twin Otter/Caravan and small planes (Johnson et al., 2000). During this same time period, 377 helicopter takeoffs and landings were recorded (average of 11.8 takeoffs and landings/day) (Johnson et al. 2000). The year 2000 also was a construction year at the Alpine Development with well drilling, facilities construction, and major structural modifications on pads being done. Between 1 June and 15 July 2000, there were 1,082 fixed-wing takeoffs and landings (average 24 takeoffs and landings/day) and 910 helicopter takeoffs and landings (average 20.2 takeoffs and landings/day) recorded (Johnson et al., 2001). Aircraft types were similar to those used in the 1999 season except for a C-130 in 2000 (8 takeoffs and landings), which was not used in 1999. During the 2001 study period (1 June-15 July), Johnson et al. (2003) reported at total of 689 fixed-wing takeoffs and landings/day (average of 15.3 takeoffs and landings/day) and 776 helicopter takeoffs and landing/day (average 173 takeoffs and landings/day). Although Alpine was in an operational phase during the 2001 nesting period there still were substantial construction activities occurring, and aircraft traffic was greater than what would be expected during a production-only phase. The BLM is expecting similar levels of aircraft activity during the summer development phases of each of the two anchor developments.

Air traffic figures currently are not available for the Alpine Development during the 2002 and 2003 production years; therefore, based on Conoco-Phillips estimate of necessary flights, BLM is estimating that 4 propeller-driven passenger planes and 5-20 helicopter flights/week would be needed to support the facility during the production phase. Helicopter flights along pipeline route are estimated to occur once/month at minimum. Maintenance of the pipeline would occur during the winter months when eiders are not present.

Studies at the Alpine Development on the Colville River Delta (Johnson et al., 2003) found distributions of most water-associated species (spectacled eiders were not sufficiently abundant, and Steller's eiders were not found in the area, to perform a specific analysis) relative to the airstrip did not show detectable differences when control and impacted areas were compared before and after construction (discussed in USDOI, BLM and MMS, In prep.:Section V.B.9.b(1)(b)2)). Numbers of nests of some species did decline between non-construction and construction years; however, because cooler temperatures coincided with heavy construction activity, it was not possible to show a direct link between nest declines and level of activity. In general, these investigations found waterfowl nest densities lower within 1,000 meters of the airstrip during the period when construction air traffic was high. However, there was no significant difference in average distance of nests from the airstrip. White-fronted goose nests (only this species is

sufficiently common to detect population trends), and probably nests of other species, were redistributed relative to the airstrip to nearby comparable habitat during heavy construction.

The BLM, in consultation with FWS, has chosen to use the population density figures of 1.11 observed birds per square kilometer for spectacled eiders and 0.06 observed birds per square kilometer for Steller's eiders. Over much of the Planning Area, the actual density of these species is lower than the presented densities. Given these density figures, it is reasonable to say that small numbers of spectacled eiders, and even smaller numbers of Steller's eiders, are likely to encounter high levels of disturbance due to aircraft noise. However, this statement does not hold true in several situations: (1) if an aircraft landing strip is placed in an area of high eider nesting density (eiders have been known to nest semicolonially so there can be relatively large numbers of individuals nesting in an area); and (2) if areas of high eider densities are directly in line with routes overflow with high frequency (from staging areas to development areas, for example). ROP E-11 requires that aerial surveys, habitat mapping and, possibly, ground-based nest surveys will be conducted by the lessee for at least 3 years prior to development. It is hoped that through this research, staging and development areas can be located in areas of lowest possible eider densities so that the fewest individuals will be impacted. Because there are few areas of high eider density in the Planning Area and surveys to locate eiders and their habitats are required to occur before development, and the results of the Alpine study, it appears that impacts to eiders from the effects of aircraft disturbance may be minor.

IV.F.3. Cleanup of Off-Pad Oil Spills

The number and size of oil spills likely to occur as a result of the Preferred Action, and the possibility of oil spills directly affecting eiders or eider nests, are discussed elsewhere in this document. Although the percent of oil spills that would occur when eiders are present on the North Slope and reach beyond gravel pads to the tundra is low, it is expected to happen. Because oil-spill-response and -cleanup activity is immediate, any eiders near a spill could be affected by these activities. Depending on the distance from eiders and the levels of activities, the impacts on eiders would be the same as described for activities on gravel pads in Section IV.F.2.a. The same responses by eiders would be expected, ranging from slight increases in energy expenditure to nest abandonment. Given all the low-probability events that must occur leading up to it, nest abandonment resulting from cleanup of oil spills likely would be rare.

IV.F.4. Displacement of Eiders from Habitats near Facilities, Roads and Airstrips

The noise and activities associated with oil field facilities potentially could cause eiders to avoid nearby habitats. A study of increased noise at a compressor facility at Prudhoe Bay (Anderson et al., 1992) showed a shift in distribution away from the disturbance by some waterfowl species, including spectacled eiders, but not all species. A processing facility in the Kuparuk Oilfield also caused variable responses by birds (Hampton and Joyce, 1985). Spectacled eider broods in both of these oil fields were found within 200 meters of high-noise facilities (TERA, 1995); therefore, some eiders might be displaced by facilities in the NW NPR-A, but it is likely that most would acclimate to disturbances that are ongoing in the operation of an oil facility. A study of shorebird and passerine distribution before and after construction of a drill pad at Prudhoe Bay (Troy and Carpenter, 1990) suggested that those individuals that were displaced, either by disturbance or the direct removal of nest sites by gravel fill, relocated in nearby, comparable habitats. Johnson et al. (2003) found that although estimated noise exposure at nests increased with aircraft traffic levels and with proximity to the airstrip, that exposure did not have a significant effect in changes in nest distribution among the 3 years of the study. If a disturbance factor is present in breeding habitats, it is likely that eiders would either tolerate it or move a short distance. Given the low density of eiders and subsequent presumed lack of competition for nesting habitats, this type of displacement is unlikely to have adverse impacts on eider populations.

Table 2 shows the maximum numbers of eiders expected to be affected by these types of disturbances and potentially displaced by them. Zones of 200 meters (Swem, 2003, pers. commun.) and 500 meters (Johnson et al., 2003) were selected to define the area for which eider numbers were calculated. Although only within the actual gravel footprint would eider displacement be certain, displacement of all eiders from the entire area defined by the two zones was assumed for purposes of calculating total numbers of individuals displaced. Relatively high estimates of density are used for spectacled (1.11birds/km^2) and Steller's (0.06 birds/km^2) eiders (Martin, Nigro, and Platte, 2003, pers. commun.; Larned et al., 2001; Larned, Stehn and Platte, 2003; Ritchie and King, 2002). These assumptions result in a relatively high estimate of the numbers of eiders potentially displaced from these areas: 6 spectacled and 1 Steller's eider from the footprint alone, 96 spectacled and 6 Steller's eiders from the 200-meter zone, and 239 spectacled and 13 Steller's eiders from the 500-meter zone. Combining the gravel footprint and 500-meter zone would result in a maximum of 245 spectacled and 14 Steller's eiders being disturbed and potentially displaced. In addition to other conservative assumptions addressed earlier in this document, these results assume that no mitigating measures for aerial survey requirements and subsequent eider avoidance will be invoked prior to design approval. This would be counter to the mitigation measures that are part of the Preferred Alternative.

Table 2. Gravel Footprint and Zones of Influence for Production and Effects on Eiders

	Gravel Footprint in Acres (km^2)	**200 Meter Zone of Influence in Acres (km^2)**	**500 Meter Zone of Influence in Acres (km^2)**
Anchor Developments (2 at 100 acres each)	200 (0.8)	1,590(6.4)	3,980 (16.1)
Satellite Developments (6 at 100 acres each)	600 (2.4)	19,100 (77.2)	47,700 (193)
Roadless Pump Station	40 (0.2)	240 (1.0)	600 (2.4)
Gravel Extraction Sites (8 at 35 acres each)	280 (1.1)	n/a	n/a
Staging Area (2)	300 (1.2)	680 (2.8)	1,680 (6.8)
Total Area	1,420 (5.7)	21,610 (87.4)	53,960 (218.3)
Spectacled Eiders Affected at 1.11/ac	6	96	239
Steller's Eiders Affected at 0.06/ac	1	6	13

IV.F.5. Facilities Maintenance

IV.F.5.a. Pipeline Maintenance

The reasonable and foreseeable scenario assumes that scheduled pipeline maintenance would occur during the winter. Because eiders would not be present, this activity would pose no disturbance. Emergency maintenance or repairs still could be done when eiders are present and, although this would be a low-probability event, it would have a potential to adversely affect eiders if it occurred. Whether or not any impact would occur, and what level the impact would be, would depend on whether or not any eiders were present in the habitats involved, what phase of the breeding cycle any nearby eiders were in, the distance between the pipeline activities and eiders, and the nature of the activity. Among the possibilities included in the range of potential impacts are minor, short-term behavioral changes, displacement from the immediate area and subsequent successful breeding elsewhere, or nest abandonment with the loss of breeding opportunity for that season. Because emergency maintenance or repair by nature would be local in extent, it likely would affect a negligible portion of the spectacled or Steller's eider populations.

IV.F.5.b. Tower Maintenance

The reasonable and foreseeable scenario does not include the construction of communication towers elsewhere than on the gravel pads. However, cellular phone towers likely would be constructed within the Planning Area by the local phone company. Construction would occur in winter, and maintenance would likely require an average of one visit every 2 months. With this schedule, a tower could be visited twice during each eider breeding season. A visit probably would involve the presence of a small crew (2-3 persons) for a few hours or less in the immediate vicinity of each tower. Access would be by helicopter. Depending on the timing of the maintenance visit and whether or not any eiders occur within the vicinity, the impacts to eiders could vary from none to accidental destruction of a nest by a helicopter. Any impact to eider populations is likely to be negligible.

IV.F.6.1. Watercraft Activity

During the summer open-water season (mid-July to early October), there could be some marine transportation of equipment and supplies needed for exploration. Barges might be used for transport because of logistic and economic issues associated with moving heavy equipment and materials, either by ice road or rolligon, over the long distances from current infrastructure. Barge traffic generally would be limited to routes in shallow, nearshore, waters between staging areas connected to existing infrastructure (e.g., West Dock or Oliktok Point) and staging areas along the coastline in the Planning Area at Cape Simpson or Barrow. Spectacled and Steller's eiders that are accompanying young, or are staging or migrating in coastal or offshore waters during the staging/migration periods (late June/early July; late August/September), could encounter vessels associated with oil and gas activities in the Planning Area. Barges delivering equipment late in the open-water season may could represent a potential collision hazard for eiders. One such case was documented in March 2001, when three spectacled eiders struck a research vessel in the northern Bering Sea wintering area under predawn light conditions (Lovvorn et al., 2003). The number of barges potentially using the area is so low (assumed up to 20) compared to the open-water area available for eiders, that the potential for collisions from this source are considered to be very low.

If facilities or pipelines are located near rivers, streams, or waterbodies, the potential for contamination of the freshwater and/or marine environment exists. ROP A-4 requires that a comprehensive spill-prevention and response-contingency plan be developed to minimize impacts to fish, wildlife or the environment as a result of fuel, crude oil, and other liquid chemical spills. Part of the prevention and response plan likely would include the use of watercraft to facilitate containment and cleanup of spilled oil. This watercraft would be used not only in a real response situation but also in spill-response training. The BLM expects that watercraft used in spill-response training to be small vessels appropriate for the predominately shallow water present in the Planning Area. Spill-response training would occur annually and is expected to involve only a few vessels and personnel. Watercraft may be used during facility development to install water-collection equipment for providing for the water needs of equipment and personnel at anchor facilities. This watercraft also may be needed on occasion to service/repair any equipment deployed in the freshwater environment. Watercraft would be stored on gravel pads close to deployment areas and would not be in the water unless being deployed for a spill-response drill or an actual oil spill. Due to the short time period that any watercraft would be expected to be in areas where eiders could be found (waterbodies), and the small number of watercraft potentially being deployed, it is reasonable to expect that the effect of watercraft on eiders would be very minor.

IV.G. Mitigating Measures

Implementation of stipulations and required operating procedures (selected and abbreviated from the list of Preferred Alternative stipulations and required operating procedures presented in Table II-03 of the IAP/EIS) could conserve important eider habitats, decreasing the probability of disturbance or displacement of eiders. The two following mitigation measures are specifically directed toward avoiding listed eiders as much as possible with the placement of oil facilities:

- require aerial surveys of breeding pairs in areas proposed for development, and consultation with FWS and BLM concerning the design of structures before approval of any construction if listed eiders are present in such areas (ROP E-11);
- require development of an ecological land classification map for use in siting facilities with the intent of moving the proposed location of facilities, to the extent possible, from habitat types of greater importance for listed eiders to those of lesser importance (ROP E-12).

The following four mitigation measures are directed toward protection of fisheries, lake-dwelling waterbirds, raptor nesting areas, and human subsistence activities. Nonetheless, they may benefit listed eiders if eider habitat occurs within the prescribed setbacks:

- restrict approval for location of permanent oil and gas facilities within 500 feet of fish-bearing waterbodies or within 100 feet of non-fish-bearing waterbodies to those that are likely to cause minimal impacts to wildlife (Stip. E-2);
- prohibit permanent oil and gas facilities within setback zones of ½-1 mile of listed waterways (Stip. K-1);
- prohibit permanent oil and gas facilities within ¼ mile of deepwater lakes with depths greater than 4 meters (Stip. K-2);
- prohibit permanent oil and gas facilities within the boundary of the Kasegaluk Lagoon Special Area.

These three mitigation measures are intended to benefit wildlife and fisheries in general, and so would provide some benefit to listed eiders as well:

- require minimal facility footprint and reduction in air traffic (ROP E-5);
- provide all personnel with information concerning applicable required operating procedures and stipulations and the importance of not disturbing biological resources, habitats, and bird colonies (ROP I-1);
- prohibit oil and gas exploration activity in Elson Lagoon, Dease Inlet and Admiralty Bay from May 15 to October 15; require that facilities minimize impacts to seasonally concentrated wildlife, which may include listed eiders, and that daily activities are conducted to minimize impacts to seasonally concentrated eiders (Stip. K-3).

IV.H. Effects of Abandonment

Abandonment and reclamation of satellite fields likely would coincide with abandonment and reclamation of corresponding anchor development sites. Abandonment operations include removal of all equipment, cutting well casings a minimum of 3 feet below the surface, and plugging wells. Gravel, or gravel/sand pads would not be removed but allowed to bed naturally. Overall, abandonment operations would take many years, as revegetation and environmental monitoring studies continue to document the long-term effects of operations at a particular site. A series of permitting and inspection activities are associated with abandonment procedures (Stipulation G-1). Abandonment activities would occur during winter months, when ice roads could be constructed to allow the removal of equipment. Monitoring abandonment would require periodic revisits to gather information on environmental parameters related to natural bedding and to document success of abandonment actions. Normally, one helicopter with a crew of three would visit the sites annually for the first 5 years, followed by increasing time gaps over the next 10 years. Site visits would include a maximum of 1 day per visit, and one visit/year. It would be expected that effects from abandonment would be negligible, because the pads would have to be in place for nearly 3 decades, and eiders would have relocated to more suitable adjacent habitat.

IV.I. Protection Recommendations

These are addressed in Section V.D.

V. CUMULATIVE EFFECTS ON SPECTACLED AND STELLER'S EIDERS

Cumulative effects are defined in 50 CFR 402.02 (Interagency Cooperation on the Endangered Species Act of 1973, as amended):"…those effects of future State or private activities not involving Federal activities that are reasonably certain to occur within the action area of the Federal action subject to consultation."

Since 1965, approximately 9.7 million acres of North Slope/Beaufort Sea acreage have been leased through 32 State sales, including many combined sales. In the past 10 years, the State has conducted 12 lease sales in this area, leasing approximately 4.5 million acres. The State has conducted annual areawide sales in the Beaufort Sea and on the North Slope since 1995. The State proposed (January 2001) to offer six areawide lease sales over the next 5 years. Each State Beaufort Sea offering will extend from Barrow to the Canadian border, while onshore sales will offer all unleased State lands between the Arctic National Wildlife Refuge and the NPR-A. The most recent sales were held in October 2002.

There currently are 25 producing oil fields on the North Slope with Prudhoe Bay, N. Prudhoe Bay, Kuparuk River, Alpine, Milne Point, and Endicott being the most productive. Alpine, which began producing on the Colville River delta in 2000, is the closest that oil field infrastructure has approached the Planning Area. Current and reasonably foreseeable development is presented in Table IV-13.

V.A. Factors Potentially Affecting Eiders

In 1997, the Alaska-breeding population of Steller's eiders was listed as threatened based on the contraction in the species' breeding range in Alaska and the resulting vulnerability of the remaining breeding population to extirpation. Factors impacting the recovery of the Alaska-breeding population of Steller's eiders are not well understood. Thus, there is a related level of uncertainty of cumulative effects. The Final Steller's Eider Recovery Plan (USDOI, FWS, 2002) notes the following factors may be potential causes of decline and/or may pose potential threats to the population: predation, hunting, ingestion of lead shot in wetlands, changes in the marine environment that could affect Steller's eider's food or other marine resources, and exposure to oil or other contaminants near fish-processing facilities in southwest Alaska. Quakenbush and Suydam (1999) reported that risks to be evaluated by the Steller's eider Recovery Team include those related to increased human settlement, disturbance in molting and wintering areas, vulnerability to oil spills, and predation during the breeding season. In April 2003, the Eider Recovery Team ranked tasks that would allow the prioritization of threats and obstacles to recovery for the Steller's eider. These tasks will be further ranked and prioritized at the fall/winter 2003 meeting of the Eider Recovery Team. Tasks that were ranked as high priority and have relevance to the Planning Area, were those having to do with (1) harvest by subsistence hunters, (2) continued use of lead shot and associated accumulation and persistence in the environment, (3) loss of breeding habitat due to human expansion and off-road vehicle use, (4) changes in predator distribution and abundance at Barrow, and (5) predator control (foxes and ravens).

The Final Spectacled Eider Recovery Plan (USDOI, FWS, 1996) states that "(F)actors known to affect or suspected of affecting Spectacled Eider survival…have been identified" but clarified that their relative importance to the decline and the recovery of the species are unknown. Thus, there also is related uncertainty about cumulative impacts on this species. Factors given as potentially affecting survival of spectacled eiders on the breeding grounds included lead-shot contamination of habitat and related lead-shot ingestion; predation; direct take in harvests; research activity; oilfield and mining development. The FWS (USDOI, FWS, 1996) concluded that: "Threats at sea, both known and potential, represent the greatest source of uncertainty in understanding the Spectacled Eider's decline." Factors given that potentially could be adversely impacting survival at sea included competition for prey (e.g., with other sea ducks, marine mammals, and possibly fishes); contaminant accumulation; harvest by humans away from breeding grounds; diseases and parasites; and fishery-related take due to collisions with vessels, incidental take in nets, and indirect effects of fisheries on prey. In February 2003, the Eider Recovery Team prioritized threats and obstacles to recovery for the spectacled eider. The four highest priority threates that have relevance to the action area are: 1) Use of lead shot and the corresponding lead accumulation and persistence in the environment; 2) Increasing predator numbers possibly due to human waste, decrease in fox trapping effort, use of human structures by predators; 3) Harvest of eiders by subsistence hunters, lack of law enforcement; and, 4) Oiling from offshore development.

Thus, available information indicates that, in addition to routine annual management actions and harvest activities in the Planning Area, factors associated with other past Federal and past and future State projects, as well as actions of nongovernmental entities on the ACP, along migration routes, or on winter ranges that potentially could contribute to current and future cumulative effects on threatened eiders include subsistence and sport harvests (and associated lead contamination of the eider's habitat); predation; wildlife research and survey activities, proposed oil and gas exploration and development in nesting and wintering habitats; commercial fishing; commercial development; environmental contamination; marine shipping; and recreational activities. Some of these projects and activities, including those associated with oil and gas development (e.g., State lease areas in Cook Inlet), affect eiders at latitudes south of the Beaufort Sea and outside the summer breeding season. Several of these activities, individually or in combination, probably affect eider populations as much or more than potential effects of petroleum development and may have contributed importantly to recent declines in these populations. While the level or significance of current impacts from most of the aforementioned factors essentially is unknown, we provide the limited information that is available in the following. As discussed in previous sections, oil exploration and development (and other projects and activities) could result in (1) oil or other toxic pollution effects; (2) additional disturbance during breeding and postbreeding periods; and (3) habitat loss or degradation that would add to cumulative impacts on listed eiders. Disturbance of some individuals as a result of oil and gas operations would be expected to be unavoidable.

V.B. Cumulative Analysis

V.B.1. Effects of Disturbance

V.B.1.a. Aircraft and Vessel Disturbance

Oil and gas developments in the Planning Area are expected to be roadless, i.e., no roads connecting an anchor development and its satellites to any other oil infrastructure or village. This design is likely to require substantial fixed-wing aircraft, helicopter, and occasional barge support during periods when eiders are present. Any oil development in adjacent portions of the NPR-A likely would be similar. Oil exploration and development in State or Federal marine waters offshore of the NPR-A probably would rely more on helicopter and barge traffic and less on fixed-wing flights. Much of the air traffic would occur in winter, when eiders are not present. Offshore development at Northstar required 2,480 aircraft (all types) per winter season extending approximately 30 November-20 April, or about 18 flights per day. Cumulative

air traffic activity in the Prudhoe Bay area, Kuparuk River, Point McIntyre, Northstar, and Alpine fields is likely to represent the greatest source of disturbance for eiders from currently developed areas.

Regardless of attempts to mitigate effects by adjusting routes, continued activity at this level to support developing fields and future development on the NPR-A likely would result in some low-altitude flights over nesting, broodrearing, staging, or migrating eiders. This would cause additional energy use by disturbed individuals and possibly the displacement of eiders from the vicinity of routinely used air corridors. The latter would be similar to eider responses observed during low-level aerial bird surveys, when individuals either run or take flight depending on species and circumstances. This could cause displacement of females with broods from preferred foraging areas during broodrearing or displacement of any individuals during preparation for migration. In extreme cases such as a helicopter hovering at very low level over a nest, the female could flush from the nest, resulting in lower productivity if eggs are lost to predators or exposure to low temperatures. Long-term displacement (1 year or more) from the vicinity of heavily used corridors and onshore facilities could result in fewer young produced and somewhat lower survival of adults and young. For example, helicopter pipeline inspection flights during production could displace some eiders from within 200-500 meters of a pipeline. Although such flights might occur frequently, perhaps once per week, they would be intermittent. Some individuals might tolerate this level of disturbance and nest, rear their broods, or forage within the pipeline corridor. Any such aircraft-related disturbance from new developments would represent additive effects over existing levels. However, because of the relatively low density of listed eiders nesting in the NPR-A, disturbance resulting from support aircraft noise and visual presence likely would affect a small percentage of the total populations of spectacled and Steller's eiders breeding in Alaska.

At some unknown level of aircraft overflights above open-water areas in spring, it is possible that some eiders would be displaced from this essential habitat. Because open water is limited in spring, access to such areas is likely to be more restricted than in the postbreeding period. This could increase competition for the food available during the stressful period following spring migration and could result in decreased survival or breeding success. Beginning in early summer, nonbreeding individuals, failed breeders, molting individuals, and males could be feeding in nearshore areas. Displacement during this period could increase the stress of preparing for migration in some individuals and decreasing chances for survival.

Any development offshore of the Planning Area could use the same marine docking facilities assumed in the project description. These would be at Barrow or Cape Simpson. Offshore development also could be staged out of Prudhoe Bay with materials transported by vehicle in winter or barge in summer. If displacement of eiders occurs in the vicinity of vessel transportation corridors, it could last through an entire open-water season. This would depend on trip frequency, which is determined by the number of concurrent projects and the stage of development. Thirteen vessel round trips per summer, from an equipment source area to an NPR-A staging area, are forecast for any one development project during the construction period. Supply vessels are likely to follow established routes, so the actual area disturbed would be limited. The area and, potentially, the numbers of individuals affected would increase if concurrent projects at different locations were to be developed. Vessel traffic occurs during the open-water season and, although numbers of birds displaced could be substantial depending upon the season of occurrence (tens or hundreds of individuals, particularly during fall migration), alternate foraging and staging habitat would be available away from probable routes.

V.B.1.b. Vehicle Disturbance

Besides the reasonable and foreseeable development for the Planning Area discussed elsewhere in this document, there could be up to three other oil field developments within the range of spectacled and Steller's eiders in the Northeast NPR-A. All future oil and gas developments in the NPR-A are expected to be isolated from existing road systems. The effects of vehicle traffic at developments in the Northeast NPR-A would be similar to that for Planning Area described in this document. These additional effects would be additive with respect to North Slope eider populations but not with respect to individual eiders. Each eider on its breeding range would be affected by vehicle traffic at one, or no, development site.

V.B.1.c. Other Disturbance Factors

Disturbance caused by factors other than those discussed above relate to human presence in areas used by eiders due to offshore construction and drilling activities and offshore support of these activities, oil-spill cleanup due to offshore development, hunting in newly accessible areas, and predators attracted to areas of human habitation. These factors vary considerably in the amount of disturbance caused. The presence of unconcealed humans, whether associated with onshore or offshore oil and gas development, hunting, or recreational activities, is disturbing to eiders, especially during nesting and broodrearing periods. Common experience confirms that such presence generally causes birds to move from the immediate area of disturbance and may displace them for several hours or longer. Cumulative effects of such disturbance may cause decreased productivity or survival of young, causing decreased recruitment into the population. The amount of human disturbance that would occur if oil were spilled from an offshore production facility is unknown but, depending on the time of year that the spill occurred, the impact to eiders could range from nonexistent (winter) to very high (if a spill occurred when staging flocks of eiders were present in the marine environment). Predation and hunting by humans may cause direct mortality to eiders. Predators such as foxes attracted to nesting areas could cause losses of eggs or young, ranging up to total nest failure for the season. Most such disturbance associated with commercial activities (excluding oil-spill response) could be controlled by mitigation. Although it is likely that behavioral effects resulting from disturbance associated with oil and gas development would be additive to naturally occurring disturbances, there is no evidence for synergism, in which the combination of effects from natural and/or development-related factors would be greater than their additive effects.

V.B.2. Effects of Habitat Alteration

Potential effects of permanent habitat alteration (habitat loss) in the Planning Area include those effects associated with potential construction projects in villages within the Planning Area in support of offshore oil and gas leasing in State or Federal waters outside the NPR-A. If construction projects in support of offshore oil and gas activities occur in the Barrow Area, there is the potential for impacts to eiders from (1) destruction of eider habitat if new gravel mine sites are necessary to support new construction projects, (2) destruction of eider habitat through placement of gravel fill for construction of roads and structures, and (3) increasing accessibility of areas currently untracked by off-road vehicles and associated damage to eider habitat. The first and second potential impacts have been discussed and analyzed in Section IV.C.1.a of this document. It is unknown if these activities would occur in the Planning Area in response to offshore oil and gas development and, if they do occur, it is unknown at this time the extent of eider habitat that would be impacted. It is reasonable to assume that if these actions do take place near Barrow, Steller's eiders are likely to be impacted, as relatively high concentrations of Steller's eiders occur in the Barrow area. The issues relevant to the third potential effect are (1) potential for loss of habitat due to off-road vehicle use in previously inaccessible areas due to construction activities in the area and (2) contamination of additional eider habitat due to deposition of lead shot in areas previously unavailable to hunters. Contamination of habitat due to introduction of lead shot in the environment is discussed in Section IV.D.2 of this document. Because it is currently unknown if any construction activities will occur in the Planning Area due to offshore oil and gas development, there is no way to quantify potential impacts to eider habitat. If construction activities do occur, consultation with the FWS will occur and impacts to eider habitat will be addressed at that time.

There also is potential for impacts to eider habitat due to temporary habitat alteration resulting from the above-stated potential development activities in the Planning Area. These impacts may include delayed snowmelt due to snow dumps from snow-removal activities on pads and roads, dust fallout due to traffic on new roads, persistent snow drifts, impoundments, thermokarst, and water withdrawal to support construction and maintenance of facilities. All of the above impacts are discussed in Section IV.C.1.b of this document. It is unknown if construction activities that would result in temporary habitat alteration would occur in the Planning Area in response to offshore oil and gas development and if they do occur, it is unknown at this time the extent of eider habitat that would be impacted. It is reasonable to assume that if these actions do take place near Barrow, Steller's eiders are likely to be impacted, as relatively high

concentrations of Steller's eiders occur in the Barrow area. If construction activities do occur consultation with the USFWS will occur and impacts to eider habitat will be addressed at that time.

V.B.3. Potential Additional Cumulative Effects

Subsistence harvesting is estimated to remove hundreds of spectacled eiders from the Alaskan population annually (58 *FR* 27474). Steller's eiders are also still harvested (USDOI, FWS, 2002c), but the percentage of the harvest that is taken from the Alaska breeding population is not clear. Increased harvest of listed eiders within the Planning Area is discussed in Section IV. Developments in the Northeast NPR-A also may increase the access of hunters to eiders in the area of Nuiqsut, although some residents there have stated that they do not prefer to hunt in the vicinity of oil field developments. Programs currently are underway by the FWS and the North Slope Borough to inform hunters of harvest closures on these two species in an effort to decrease this source of mortality.

There is potential for collisions of eiders with structures and vehicles associated with offshore oil and gas development. These potential collisions include those associated with offshore oil and gas development structures and support services and onshore support facilities for offshore oil and gas development. Structures associated with offshore oil and gas development include offshore platforms, related onshore pipelines, barges, helicopters, and oil-spill-response watercraft. The time of year when offshore activities would have the greatest potential for impacts to eiders would be during the late summer/fall staging period, when relatively large numbers of eiders are found in marine areas. Migration pathways of eiders may include areas where offshore production facilities are constructed, resulting in potential for collisions between eiders and those structures. Eiders could collide with watercraft responding to an oil spill from a pipeline or oil-producing platform. Helicopter flights would be necessary to support offshore platforms, and there is potential for collisions between eiders and helicopters. Offshore facilities also would be supported by barges, which also represent a collision hazard to eiders. Research currently is being conducted to assess the potential for collisions between birds and offshore oil-producing facilities (Northstar development) and to develop methods by which collisions can be reduced. Structures associated with onshore support of offshore oil developments include support facilities; communication and power lines and towers; pipelines; and support watercraft. motor vehicles, and aircraft. The effects of collisions to eiders from these structures are discussed in Section IV of this document and are expected to be similar. If power lines would be needed in support of offshore oil and gas development, they may have greater effects on eiders than those discussed in Section IV, because these may be strung on poles and not on pipeline VSM's. Power lines strung from poles are a known collision hazards to birds and could account for additional mortality to eiders. Because we do not know where or if any offshore oil-producing facilities would be constructed, we cannot assess the potential impacts of these facilities to eiders. If these facilities are built in the future, consultation with FWS would occur and these potential impacts would be addressed.

V.C. Effects of a Large Oil Spill

V.C.1. Marine Habitats

If future oil field development were to occur in State or Federal marine waters offshore of the Planning Area, there would be some low, but positive, probability of a large oil spill. If one or more spill were to occur, substantial eider losses could result if oil were released during the summer/fall season, when flocks of eiders could be present. The number of eiders affected potentially could total tens to low hundreds of individuals. Using average estimated spectacled eider density in the central Beaufort Sea area calculated from FWS survey data, and average severity of spill-trajectory paths (and, thus, exposure of birds to oil), a FWS model estimated an average of only two eiders would be exposed to a large spill (5,912 barrels) within 30 days in July (Stehn and Platte, 2000). However, in late July one group of 144 individuals was observed, suggesting a potential for much higher mortality. Also, most eiders observed during FWS aerial

surveys in 2001 from Point Barrow east were located along the northern Planning Area boundary. It is likely that mortality resulting from oil spills would be additive to naturally occurring mortality. In addition to direct contact losses, any declines of prey populations in foraging areas contacted by oil from a spill at any time of year could result in secondary impacts on eiders, affecting productivity and/or survival. Likewise, negative effects of a spill on shoreline and coastal marsh habitat and water quality could affect eiders adversely when moving from onshore broodrearing areas to the marine environment, or in subsequent years.

V.C.2. Terrestrial /Freshwater Habitats

A large onshore spill released during the summer season on lands east of the Planning Area could cause losses of molting and broodrearing eiders, in addition to smaller numbers of nesting eiders, if it were to enter a heavily used lake or river system or coastal habitat. Spills from a regional pipeline farther east would not be expected to cause substantial losses of eiders, because there are relatively low densities so far to the east on the ACP. In the immediate vicinity of the pipeline, some habitat contacted by oil would become unsuitable for nesting, broodrearing, or foraging by eiders. Oil entering freshwater aquatic habitats could spread more widely, including into river deltas and nearshore marine habitats, and result in the death of eiders if contacted.

V.C.3. Effects of Small Spills

Small spills on lands or waters adjacent to the Planning Area, whether from infield pipelines or spills of refined products, are expected to be contained on gravel pads or islands or cleaned up before substantial losses of eiders could occur. In addition to direct contact, some mortality could result through ingestion of contaminants in forage from the cumulative effects of the numerous small spills expected from the operation of any oil field.

V.D. Protection Recommendations

V.D.1. North Slope Science Initiative

A North Slope Science Initiative currently is being developed that will address inventory, monitoring, and research needs across the North Slope, including the National Petroleum Reserve-Alaska. This initiative, with State/Regional Director-level guidance from the BLM, FWS, MMS, U.S. Geological Survey, Alaska Department of Fish and Game, Alaska Department of Natural Resources, and the North Slope Borough, will consider proposals for all scientific initiatives, including those studies related to spectacled and Steller's eiders.

V.D.2. Spectacled and Steller's Eider Recovery Teams

The BLM has representation on both the spectacled and Steller's eider recovery teams. Recommendations for inventory, monitoring, or research, developed by those recovery teams, are expected to be addressed within the North Slope Science Initiative and will be forwarded to the North Slope Management Oversight Group for consideration.

V.D.3. Leasing Stipulations and Required Operating Procedures

Implementation of stipulations and required operating procedures (selected and abbreviated from the list of Preferred Alternative stipulations and required operating procedures presented in Table II-03 of the IAP/EIS) could conserve important eider habitats, decreasing the probability of disturbance or displacement of eiders. The two following mitigation measures are specifically directed toward avoiding listed eiders as much as possible with the placement of oil facilities:

- require aerial surveys of breeding pairs in areas proposed for development, and consultation with FWS and BLM concerning the design of structures before approval of any construction if listed eiders are present in such areas (ROP E-11);
- require development of an ecological land classification map for use in siting facilities with the intent of moving the proposed location of facilities, to the extent possible, from habitat types of greater importance for listed eiders to those of lesser importance (ROP E-12).

The following four mitigation measures are directed toward protection of fisheries, lake-dwelling waterbirds, raptor nesting areas, and human subsistence activities. Nonetheless, they may benefit listed eiders if eider habitat occurs within the prescribed setbacks:

- restrict approval for location of permanent oil and gas facilities within 500 feet of fish-bearing waterbodies or within 100 feet of non-fish-bearing waterbodies to those that are likely to cause minimal impacts to wildlife (Stip. E-2);
- prohibit permanent oil and gas facilities within setback zones of ½-1 mile of listed waterways (Stip. K-1);
- prohibit permanent oil and gas facilities within ¼ mile of deepwater lakes with depths greater than 4 meters (Stip. K-2);
- prohibit permanent oil and gas facilities within the boundary of the Kasegaluk Lagoon Special Area.

These three mitigation measures are intended to benefit wildlife and fisheries in general, and so would provide some benefit to listed eiders as well:

- require minimal facility footprint and reduction in air traffic (ROP E-5);
- provide all personnel with information concerning applicable required operating procedures and stipulations and the importance of not disturbing biological resources, habitats, and bird colonies (ROP I-1);
- prohibit oil and gas exploration activity in Elson Lagoon, Dease Inlet and Admiralty Bay from May 15 to October 15; require that facilities minimize impacts to seasonally concentrated wildlife, which may include listed eiders, and that daily activities are conducted to minimize impacts to seasonally concentrated eiders (Stip. K-3).

V.E. Summary

The cumulative effects on spectacled and Steller's eiders of future developments both onshore and offshore of the Planning Area and on lands to the east likely would be greater than for activities associated with the Preferred Alternative alone. Disturbance of some individual eiders as a result of both onshore and offshore oil and gas operations probably are unavoidable over the long term. The cumulative effects from typical activities associated with exploration and development of oil and gas prospects in the Planning Area, lands to the east, and adjacent marine areas may include small declines in local nesting or loss of small numbers of spectacled eiders, and potentially Steller's eiders, through disturbance effects on survival and productivity, predation pressure enhanced by human activities, and collisions with structures.

Declines in fitness, survival, or production of young could occur where eiders are exposed frequently to various disturbance factors, particularly low-level helicopter traffic. Human presence that would disturb nesting or broodrearing eiders, or attract predators, could result in predation of unprotected eggs or young. Because of smaller disturbed areas, the effects of future project infrastructure on eider populations,

although additive to natural effects, would be expected to be less severe than with previous arctic oil field developments. The frequency of such disturbance is expected to be highest in the vicinity of primary support facilities. Overlap between cumulative project developments could increase disturbance effects. Spectacled and Steller's eiders, for which no statistically significant population trends are apparent on Alaska's North Slope, could be slow to recover from small losses or declines in fitness or productivity. No significant overall population effect would be expected to result from small losses. However, recovery from any short-term losses associated with oil and gas development could be hindered by lowered survival or productivity resulting from anthropogenic causes elsewhere or natural occurrences anywhere in the species' range.

Onshore spills (large ones considered unlikely) would be expected to be contained and cleaned up; however, a spill entering a lake could cause some loss of broodrearing eiders plus smaller losses of nesting individuals. If a large oil spill were to occur in or reach the marine environment during high-use periods some, and perhaps substantial, mortality of eiders would be possible; any substantial loss of eiders could represent a significant population effect and an important obstacle to full population recovery. Mortality resulting from the cumulative effects of oil and gas projects (oil spills, collisions, or increased predation or hunting) would be additive to natural mortality and would interfere with the recovery of these species' ACP populations.

V.F. Conclusions

Cumulative disturbance and mortality factors, associated with oil and gas and other activities in the Planning Area and surrounding lands and waters, may cause small, local declines in numbers of nesting eiders, or a small decrease in productivity. Spatial and temporal overlap among cumulative project developments could increase these effects, resulting in delayed recovery from threatened status. None of the management or industrial activities discussed are likely to cause significant population effects. However, although the probability of occurrence is low, a large oil spill that reaches marine areas when flocks of eiders are present could result in substantial eider mortality and interfere with recovery of either species.

V.G. Agency Determination

Section 7(a)(2) of the Endangered Species Act of 1973, as amended, requires the action agency to insure any action authorized, funded, or carried out by such agency is not likely to jeopardize the continued existence of any endangered, or threatened species, or take an action that would result in the destruction or adverse modification of habitat of such species. The Bureau of Land Management, with respect to reasonably foreseeable development scenario, presented in this document, determines its actions may have an affect on the threatened spectacled and Steller's eiders. Although a small amount of habitat may be disturbed, or modified by the reasonably foreseeable development scenario, the Planning Area has no designated critical habitat.

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