



U.S. Fish and Wildlife Service

Environmental Assessment

Reintroduction of Steller's Eiders to the Yukon-Kuskokwim Delta, Alaska

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1. Executive Summary

In this Environmental Assessment (EA), the U.S. Fish and Wildlife Service (Service) describe No Action and Preferred Alternatives for potential efforts to use reintroduction to reestablish breeding Steller's eiders in western Alaska. We anticipate that reestablishment of this subpopulation will only occur through reintroduction. Reestablishment of this subpopulation is necessary to meet recovery criteria outlined in the Steller's Eider Recovery Plan (Plan) for the Alaska-breeding population of Steller's eiders, which is classified as threatened under the Endangered Species Act (ESA). The EA includes a description of actions taken to date in evaluating the potential for reintroduction, concerns identified during the Scoping process, and describes potential biological and social effects of reintroducing Steller's eiders to western Alaska.

In the Preferred Alternative, reintroduction efforts would occur for several years, and we would use adaptive management techniques to incorporate new information, reduce uncertainties, and minimize risk. Program implementation would include captive propagation of Steller's eiders, habitat assessment and release site selection, release of captive eggs/birds into the wild, and monitoring to evaluate progress and inform future decisions. These phases are not sequential, but concurrent: releases will likely occur in multiple years, monitoring will take place annually to inform future decisions, and we may need to conduct new site assessments if changing release sites is necessary. Small-scale, short-term predator control may take place at release sites. Reintroduction activities may affect communities on the Yukon-Kuskokwim Delta (YKD) of Alaska and near Izembek Lagoon, and we would continue to seek input from potentially-affected parties throughout the program.

2. Introduction, Purpose, Need, and Scoping

a. Introduction

In December 1990, the Service was petitioned to list the Steller's eider (*Polysticta stelleri*) under the ESA. Due to contraction of the species' breeding range in Alaska and the resulting increased vulnerability of the remaining Alaska-breeding population to extirpation, the Service listed the Alaska-breeding population as threatened in 1997 (USFWS 1997). Recovery efforts for the Alaska-breeding population of Steller's eiders are guided by the Plan, signed in 2002. A recovery criterion identified in the Plan requires that a subpopulation of Steller's eiders in western Alaska persist by having a $\leq 10\%$ probability of extinction in 100 years and is stable or increasing. Under the National Environmental Policy Act of 1969 (NEPA), this EA evaluates the potential environmental and socioeconomic effects of reintroducing Steller's eiders to western Alaska.

In this section, we provide a brief description of Steller's eider life history, population status, and distribution, and discuss the purpose and need for reintroduction efforts. A discussion of ongoing efforts of the Service to consult with Alaska Native tribes and corporations and requests for comments during the Scoping process follows.

i. Steller's Eider Life History

The Steller's eider is the smallest of four eider species, with both sexes weighing about 800 grams (1.8 pounds) (Fredrickson 2001). Steller's eiders in Alaska nest on tundra adjacent to small ponds or within drained lake basins, generally near the coast but also up to 90 kilometers (56 miles) inland (Frederickson 2001). Young hatch in late June (Frederickson 2001). Shortly after hatching, females lead ducklings to nearby wetlands to feed on aquatic insects and plants until they are capable of flight at about 40 days (Obritschkewitsch et al. 2001).

Three breeding populations of Steller's eiders are recognized: one in Alaska and two in Arctic Russia. The Alaska-breeding population nests primarily on the Arctic Coastal Plain, although a very small subpopulation remains on the YKD (Figure 2.1, Figure 4.1). The majority of Steller's eiders breed in Russia and are separated into two breeding and wintering distributions (Nygard et al. 1995). The Russian-Atlantic population nests west of the mouth of the Khatanga River and winters in the Barents and Baltic seas. The Russian-Pacific population nests east of the Khatanga River and winters in the southern Bering Sea and northern Pacific Ocean where it mixes with the Alaska-breeding population (Figure 2.1).

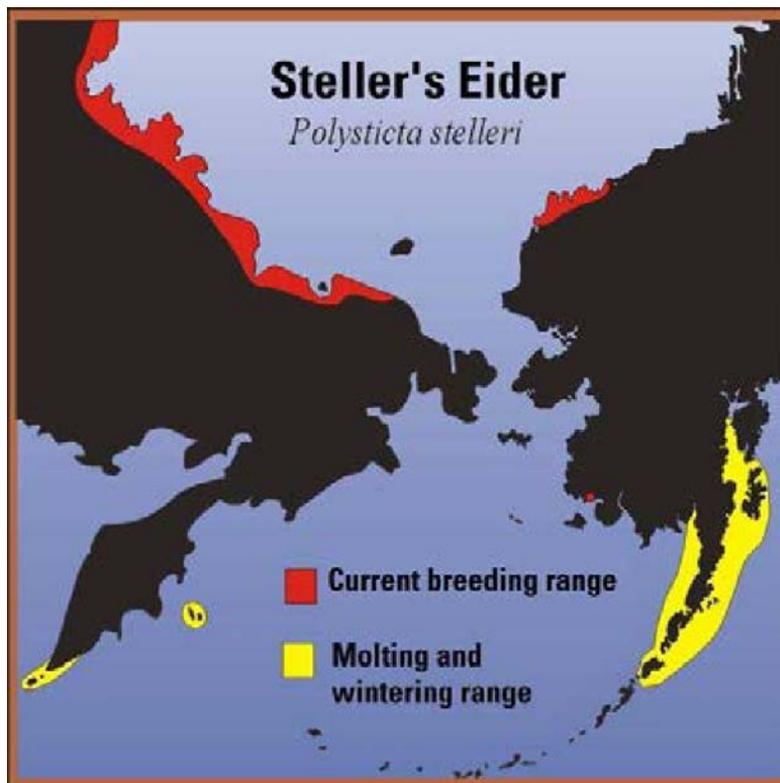


Figure 2.1. Distribution of the Russian-Pacific (to the Lena River Delta) and Alaska subpopulations of Steller's eiders.

After breeding, Steller's eiders move to marine waters and undergo a complete molt, including replacement of flight feathers. Steller's eiders from both the Alaska- and Russian-Pacific populations molt in several locations in southwest Alaska with the largest numbers occurring in three molting areas along the Alaska Peninsula: Izembek Lagoon, Nelson Lagoon, and Seal

Islands (Gill et al. 1981; Petersen 1981; Metzner 1993). Kuskokowim Shoals, an area offshore of the YKD, also provides molting habitat (Martin et al. 2015; USFWS 1997). Molting areas are characterized by extensive shallow areas with eelgrass (*Zostera marina*) beds and intertidal sand flats and mudflats where Steller's eiders forage on marine invertebrates such as molluscs and crustaceans (Petersen 1980, 1981; Metzner 1993). After molting, many Steller's eiders disperse to the Aleutian Islands, the south side of the Alaska Peninsula, Kodiak Island, and as far east as Cook Inlet, although thousands may remain in the lagoons used for molting unless freezing conditions force them to move to areas with less ice.

Steller's eiders generally winter in waters less than 10 meters (30 feet) deep, usually within 400 meters (400 yards) of shore except where shallows extend farther offshore in bays and lagoons or near reefs. Prior to spring migration, thousands to tens of thousands of Steller's eiders stage in estuaries along the north side of the Alaska Peninsula, including several areas used during molt and winter. From there, they migrate along the coast of the Bering Sea, lingering for days or weeks to feed and rest in productive areas along Bristol and Kuskokwim bays before continuing to nesting areas (Larned 2005, 2012).

ii. Population Status and Distribution of the Alaska-breeding Population

The threatened Alaska-breeding population of Steller's eiders occurs as two subpopulations: the northern and western subpopulations. Historical records indicate the northern subpopulation nested on the Arctic Coastal Plain from Wainwright east, nearly to the Alaska-Canada border (Anderson 1913), but its range appears to have contracted and it has not been observed on the eastern Arctic Coastal Plain in recent decades. Historical data suggests the western subpopulation formerly nested on the YKD, possibly in significant numbers (Murie 1924; Conover 1926; Brandt 1943; Dufresne 1924; Murie 1959; USFWS 1997), and at least occasionally at other western Alaska sites (e.g., the Seward Peninsula, St. Lawrence Island, and possibly the eastern Aleutian Islands and Alaska Peninsula; Murie 1959). However, only eleven nests have been found on the YKD since 1997 (Flint and Herzog 1999; Service, unpublished data).

b. Purpose of the Action

The purpose of the proposed action is to reestablish a viable western Alaska subpopulation of breeding Steller's eiders by reintroducing the species to the YKD. A viable western Alaska subpopulation is one of the key recovery criteria for Alaska-breeding Steller's eiders, and must be met if the species is to be delisted. This EA considers impacts to the biological and social environments that may result from reintroduction efforts.

c. Need for the Action

The Service's purpose for reintroducing a subpopulation on the YKD is to assist in the recovery of the Alaska-breeding Steller's eider. In the Plan the Service identified two criteria for delisting (USFWS 2002): the Alaska-breeding population has a $\leq 1\%$ probability of extinction in the next 100 years; and both the northern and western subpopulations have $\leq 10\%$ probability of extinction in 100 years and are stable or increasing. Thus, the western subpopulation must

survive or, if extirpated, be re-established for the Alaska-breeding population to be considered for delisting.

d. Consultation and Coordination with Tribes

The proposed action could affect Alaska Natives, their tribes, and Alaska Native Claims Settlement Act corporations. This NEPA analysis is only a small portion of on-going government-to-government consultation and coordination with potentially affected communities, tribes, and corporations. We began consultation prior to formally proposing reintroduction, and we would continue to seek input of potentially-affected Alaska Native tribes and corporations during all phases of the reintroduction program. Prior to initiation of the NEPA process, we began communicating with Tribal governments and corporations on the YKD's central coast, as these areas were considered the most likely to be potentially affected by reintroduction (Appendix 1). Before Scoping began, an invitation to participate in government-to-government consultation was extended to federally-recognized Alaska Native tribes and corporations within the Affected Environment (larger than the YKD). We also invited these groups to participate in a teleconference held on March 3, 2014. Later that month we described our proposed reintroduction efforts and answered questions by phone at two tribal meetings.

e. Scoping Process

The Service published a request for Scoping comments that initiated the NEPA process on February 14, 2014. The Service sent the notice to individuals, agencies, conservation groups, landowners, local governments, Alaska Native corporations, tribal councils in or near proposed reintroduction sites, the Alaska congressional delegation, and others who expressed interest in the project (Appendix 1). On February 21, 2014, a Facebook page and Service website were established to increase information sharing with the public. Public service announcements were sent to radio stations in the Bethel region prior to public meetings, which were held in Anchorage, Bethel, Hooper Bay, and Newtok. The Scoping period ended April 15, 2014.

f. Issues and Concerns

We received four written comments and tens of individuals provided oral comments during telephone conversations, Scoping meetings, and tribal consultations. The following issues were identified and are addressed in this EA:

- Benefit of designating the western subpopulation as an “experimental and non-essential population” under the ESA;
- Hope for employment opportunities associated with the reintroduction;
- Request for involvement of local residents in the project;
- Loss of private property rights due to presence of Steller's eiders;
- Concern the project will increase human activity and reduce subsistence harvests;
- Concern important subsistence areas will be closed;
- Accidental shooting could lead to federal citations or closure of migratory bird harvest;
- Lack of monitoring could result in loss of valuable captive-reared birds;
- Failure of released birds to survive upon release;

- Concern that presence of lead shot on the breeding grounds may harm reintroduced birds;
- Research on the nesting grounds will disturb and displace wildlife;
- Changing climate will make recovery difficult;
- Released captive birds will introduce diseases to native wildlife;
- Conducting experiments could jeopardize the balance of the ecosystem; and,
- The presence of reintroduced Steller's eiders could increase regulatory requirements for resource development projects or other human activities.

Other issues raised were deemed not relevant because they were: 1) outside the scope of the proposed action; 2) already decided by law, regulation, or other higher level decision; 3) irrelevant to the decision to be made; or, 4) conjectural and not supported by scientific or factual evidence (40 CFR 1506.3).

3. Alternatives

We consider two alternatives in this EA: the No Action Alternative and the Preferred Alternative of reintroducing Steller's eiders to the YKD.

a. No Action Alternative

Under the No Action Alternative, the Service would not reintroduce Steller's eiders to the YKD. Service employees and partners would not establish temporary facilities to support release and monitoring efforts. Actions such as field crews conducting site assessments, transport of field crews by aircraft or boat, nest-searching, releasing birds, or conducting predator management on the YKD would not occur. Additionally, other objectives associated with reintroduction (e.g., hiring of local youth and adults and outreach programs) would not occur. Under this alternative the western Alaska subpopulation is not likely to increase, leaving the extant threatened population more vulnerable to extirpation. Thus, the Service is unlikely to meet the established recovery criteria for this species (USFWS 2002).

b. Preferred Alternative

The purpose of the Preferred Alternative is to reestablish a viable western Alaska subpopulation through reintroduction, which would fulfill a recovery goal for Alaska-breeding Steller's eiders. The Service proposes to begin a reintroduction project and will continue to develop and adapt the project unless or until it is deemed unfeasible based on biological, logistical, or fiscal limitations or concerns. The first stage will be a pilot project taking place on Kigigak Island in 2016. For background, we discuss the history of the decision-making process to reintroduce Steller's eiders to the YKD and summarize our implementation plan.

c. History of the Decision-making Process

Structured Decision-making and Adaptive Management

After the Service listed the Alaska-breeding population of Steller's eiders as threatened, a team of species experts (the Spectacled and Steller's Eider Recovery Team; [Team], see Appendix 2) and Service staff applied structured decision-making methods to evaluate the biological, social,

and economic feasibility of reintroduction (Table 3.1). Structured decision-making (SDM) is an organized approach to identifying and evaluating options and making choices in complex decision situations. This process enabled the Service to explicitly address uncertainty and respond transparently to legal mandates and public preferences or values; thus, SDM integrates science, policy, and social values explicitly. Should reintroduction efforts be implemented, one goal will be to learn from early actions to improve subsequent management decisions. Thus, adaptive management techniques will be used throughout to incorporate new information, reduce uncertainties, and minimize risk. Adaptive management is a special case of SDM for decisions that are iterative or linked over time.

Table 3.1. Timeline of events in the structured decision-making process of the Spectacled and the Team leading up to the formal proposal of the Preferred Alternative.

Date	Event	Description
2005	Team meeting	New high priority recovery tasks: establish a captive flock and form a reintroduction subcommittee to conduct a feasibility analysis.
Jan 2007	Team meeting	First of interim feasibility analyses presented to team by reintroduction subcommittee; feedback received.
Dec 2007	Team meeting	Second of interim feasibility analyses presented to team by reintroduction subcommittee; feedback received.
Jan 2008	Structured Decision Making Workshop at National Conservation Training Center	A group of Team members and SDM experts met to develop tools for the decision making process, and define reintroduction objectives and alternatives
Feb 2009	Team meeting	The Team reviewed existing information and recommended to maintain and manage the existing reservoir captive population and future capacity for reintroduction. SDM Workshop report presented to Team; Team recommended continuing decision analysis and research to evaluate reintroduction as a tool.
Feb 2010	Habitat Workshop	Participants identified candidate areas for reintroduction, developed site selection criteria and identified research needs to support the feasibility analysis and decision making.
Sept 2011	Service outreach planning meeting	Service staff met to begin planning outreach objectives for the reintroduction planning process.
Dec 2011	Team meeting	The reintroduction subcommittee updated the Team on the planning process and discussed critical information needs.
Mar 2012	Organizational meeting	A group of Team members and other experts met to discuss model inputs and organize other available information prior to stakeholder meetings.

Date	Event	Description
April 2012	Service stakeholder meeting	A meeting with potentially affected Service staff was held in Anchorage to inform them of the planning and decision making process and gather their input.
Sept 2012	Stakeholder meetings in Bethel and Anchorage	Meetings were held in Bethel and Anchorage to inform potential stakeholders, including YKD community members, tribal and local governments, Native corporations, Non-governmental organizations and other government agencies, of the decision making process and gather their input.
Dec 2012	Team meeting	The Service asked for Team input on the prognosis of success of Steller's eider reintroduction based on their expert evaluation of the available biological and ecological information.
Jan 2012	Internal Service meetings	In a series of meetings, the Team Leader and Coordinator discussed reintroduction with a group of upper-level managers in the Service (Assistant Regional Directors for Ecological Services, Migratory Bird Management, Refuges and Law Enforcement) and with the Deputy and Regional Director.
Jan 2012	Service Regional Director decision	The Regional Director decided to further pursue the possibility of reintroducing Steller's eiders to the YKD and begin the regulatory, fundraising and implementation process.
Feb 2013	Stakeholder notification	Letters were sent to stakeholders notifying them of the Regional Director's decision.
Feb 2014	NEPA process initiated	Letters sent to potential stakeholders (See Appendix 1).

d. Implementation

Our approach for program implementation includes captive propagation of Steller's eiders, habitat assessment and release site selection, release of captive birds into the wild, and monitoring to evaluate progress and inform future decisions. These phases are not sequential, but concurrent: releases will likely occur in multiple years, monitoring will take place annually to inform future decisions, and we may need to conduct new site assessments if changing release sites is necessary. Our implementation plan also includes the objectives of minimizing disease risk, minimizing genetic and behavioral consequences of captive breeding, seeking input from and involving local communities, and complying with applicable laws, regulations, and Service policy. We expect protocols and timing of project components will change as we learn, perhaps even annually. Monitoring will evaluate success at meeting biological objectives, such as successful releases and eventual recruitment of breeding Steller's eiders into the area, and also social objectives, such as engaging local communities in conservation efforts and minimizing effects to subsistence practices.

Captive Propagation

The Alaska SeaLife Center (SeaLife Center) in Seward, Alaska, currently maintains a flock of: 1) twenty-two Steller's eiders hatched from eggs collected from nests near Barrow; 2) thirty-four of their captive-bred offspring; 3) one Steller's eider brought in from Barrow as an injured juvenile; and 4) nine Steller's eiders captured as adults on the Alaska Peninsula. The SeaLife Center currently has the capacity to produce approximately 250 eggs or 60 ducklings per year for release.

Habitat Assessment and Release Site Selection

An essential phase of the project is to assess potential sites for releases and support facilities on the YKD. We are considering logistical, ecological, and social factors to identify potential rearing and release sites. Ecological considerations include wetland habitat characteristics and disease and contaminant exposure risks. Social considerations will help minimize negative impacts and maximize positive benefits to local communities.

Site-specific suitability assessments are being conducted by the SeaLife Center and Service staff. Areas currently under consideration include Kigigak Island and the lower Kashunuk River, but others may be considered as new information becomes available. Wetland habitat is being characterized using field measurements and remote sensing data following established protocols for habitat type assessments and monitoring of long-term change on the YKD (Jorgensen and Dissing 2010; Macander et al. 2012). Disease, parasite, and contaminant-exposure risk is being assessed by screening juvenile spectacled eiders and other suitable indicator species using serology, microbial swabs, and fecal screening for parasites, and tissue sampling for contaminant exposure.

During 2014-2015, the SeaLife Center led work on release site selection and habitat assessment, with assistance from the Service. Discussions about habitat suitability and the effect of climate change on YKD habitats occurred at several Steller's eider Recovery Team (SERT) meetings, and at a 2009 expert workshop. Areas within the vegetated intertidal zone of the central YKD from the Askinuk Mountains to northern Nelson Island, which encompasses the majority of Steller's eider nest observations, were included in the analysis. Candidate sites were ranked on logistical feasibility and ecological factors by people who live and work on the YKD based on accessibility, infrastructure feasibility, land ownership, potential disturbance to released Steller's eiders birds, potential for lead shot contamination, and favorable habitat characteristics. The Kashunuk River area and Kigigak Island ranked highest, so in 2014 and 2015, both sites were evaluated for habitat suitability (vegetation type, water chemistry, and invertebrate - food - availability) (Hollmén 2015). We also sampled waterfowl hens and ducklings to evaluate exposure to contaminants and pathogens at these sites. Nevertheless, based on potential for lead exposure at Kashunuk, historical observation of Steller's eider nests (USFWS unpubl. data), the presence of an established field camp at Kigigak, and density of nesting waterfowl that can serve as surrogate hens, we will conduct an experimental release of Steller's eider eggs at Kigigak Island in 2016.

Our site selection process also requires consideration of potential negative and positive effects to local communities. We are communicating with local community members to identify potential release locations that would not interfere with subsistence activities. As the project develops we will seek input to identify sites that would minimize negative effects and potentially benefit local

communities by facilitating education and employment opportunities. For the 2016 project Kigigak Island has been selected in part because it is not an area that is heavily used for subsistence activities therefore, the project should not disturb or affect subsistence users.

Release Methods

Although successful release methods have been developed for several waterfowl and other bird species, we expect experimentation will be necessary to develop effective methods for Steller's eiders. At this time, the role of parental guidance in developing successful foraging, predator avoidance, and migratory behaviors is unknown. Further, it remains unknown when and how Steller's eiders imprint upon the area of natal origin, which presumably is involved in facilitating natal philopatry. Thus, we have identified a suite of possible release methods that vary in terms of: the duration and location that ducklings are held prior to release; the degree to which captive or wild hens are used to provide behavioral guidance; the facilities needed to support the method; and whether ducklings are transported to migration/molt areas after ducklings are reared and imprinted on the YKD during summer. We anticipate experimenting with multiple potential methods and refining subsequent release decisions based on monitoring results. Possible release methods include:

- Releasing small ducklings without prolonged captivity on the YKD (“hard releases”);
- Rearing ducklings for several weeks in large enclosures on the YKD and releasing older ducklings prior to fledging (“soft releases”);
- Rearing ducklings in enclosures on the YKD until fledging age, then transporting them to molting areas such as the Kuskokwim Shoals or Izembek Lagoon prior to release (“assisted migration”);
- Bonding captive reared ducklings with hens trapped in the wild at Kuskokwim Shoals or Izembek Lagoon, then releasing hens with adopted broods as family units (“foster hen”);
- Augmenting naturally-occurring Steller's eider nests or broods with captive-reared eggs or ducklings (“nest or brood augmentation”); and,
- Substituting eggs of wild surrogate nests or augmenting broods of surrogate species (e.g., common eiders or other duck species) with Steller's eider eggs or ducklings produced in captivity (“surrogate”).

For the 2016 pilot project we intend to use the “surrogate hen” method.

Our primary objective in 2016 is to determine whether it's feasible to use commonly occurring, ducks that nest on the YKD to hatch and raise Steller's eider ducklings from eggs produced by the captive flock at the SeaLife Center. This “surrogate hen” approach was selected because the SeaLife Center staff found Steller's eider eggs have much greater hatching success when at least partially incubated by a hen, rather than entirely in an artificial incubator. Also, Steller's eider ducklings may be more apt to learn proper foraging and survival behaviors when raised by a wild hen. Factors considered when choosing surrogate species included nesting abundance and density, tolerance to nest manipulation, incubation behavior, brood rearing strategy and duration, clutch size, non-breeding distribution, and the number of Steller's eider eggs that could reasonably be placed in each surrogate nest. No single species was found to be a perfect match to Steller's eider breeding behavior or non-breeding distribution so three species that proved to be a reasonable compromise were chosen based on responses to a query of YKD waterfowl

experts. These are Pacific common eider (*Somateria mollissima v-nigrum*), northern pintail (*Anas acuta*) and greater scaup (*Aythya marila*). While we won't actively search for long-tailed duck (*Clangula hyemalis*) nests, we intend to use any found opportunistically for clutch replacement in the event that we fail to find a suitable number of nests of the three primary surrogate species.

Facilities

The type of facilities needed vary with release method used. Reintroduction efforts may require: 1) a breeding facility at the SeaLife Center; and 2) a field camp and possible field release facilities at the release site. We describe these in more detail below:

Breeding Facility (SeaLife Center)

The SeaLife Center is an existing facility located in Seward, Alaska. Construction of new breeding areas and pools may be needed to increase capacity and production of releasable birds.

Field Camp at Release Site

All methods may require a temporary camp consisting of mobile structures (e.g., tents, weatherports, and/or fenced enclosures) at the release site to house field crews, and for some methods, Steller's eider ducklings. The size and amount of infrastructure would vary among methods. Regardless of release method, the facility must provide eiders with protection from predators, severe weather, disturbance, and allow for food supplementation and monitoring. We anticipate the camp and associated facilities will be removed annually to protect them from flooding and winter weather and because release sites may change.

Monitoring

We would monitor during all phases to measure our progress and the need to change protocols. Development of a monitoring plan involves several steps, including: 1) identification of monitoring targets; 2) selection of marking techniques and monitoring methods; 3) determining the frequency and scope of monitoring efforts; 4) implementing monitoring; and 5) evaluation of results to improve future decisions.

For reintroduction to be successful, released birds must move to appropriate molting, staging, and wintering areas, survive to adulthood, and then return to the YKD and successfully reproduce. The initial monitoring objective would be to evaluate if released Steller's eiders survive and persist in the wild. Subsequent efforts would focus on released birds returning to the YKD to breed. Five vital rates have been identified as key monitoring targets: 1) survival from release until fledging; 2) survival from fledging until reaching molting or wintering areas; 3) first-year survival (i.e., survival from hatching until age of one year; 4) return of adult (2+ year-old) birds to the YKD; and 5) reproduction. We will also monitor success of other aspects of the program such as community involvement and effects to subsistence practices.

We will incorporate advice from subject-matter experts to apply the most cost-efficient and effective monitoring methods. Evaluating potential methods of monitoring is ongoing and is intended to keep pace with advancing technologies. Methods that may be used include aerial surveys and/or radio or satellite telemetry to locate released or breeding Steller's eiders and colored and metal leg bands, DNA genotyping ("fingerprinting"), or other technologies to

distinguish among individuals. We have developed a list of selection criteria to further evaluate the marking/monitoring options, including detection range, location precision, cost, expected precision of estimates, retention rate, failure rate, and potential for carrier effects (mortality or morbidity of marked birds).

For 2016, our primary monitoring objectives are to determine whether: 1) the surrogate hen method works; 2) ducklings survive to fledging age; and, 3) fledglings successfully depart from the YKD and find molting and wintering grounds. To achieve these objectives, we will mark surrogate hens and ducklings with external VHF transmitter and use a combination of ground-based and aerial telemetry.

Minimizing Disease Risk

The SeaLife Center staff members have developed a management plan to maintain the health of captive and wild populations by preventing, treating, and controlling disease in the captive population. The current disease management plan for the captive population includes biosecurity practices to minimize exposure to pathogens, health monitoring and disease screening, and treatment and response plans to address potential disease concerns. Prior to release of eggs or birds to the YKD, pre-release health monitoring, monitoring of released birds, and disease response plans at all stages of the project would be developed and implemented.

The SeaLife Center also performed an extensive risk analysis that followed recommended guidelines for animal reintroduction provided by animal reintroduction and disease prevention experts. The risk analysis consisted of three main steps: 1) identifying, 2) ranking, and 3) evaluating the potential consequences of risk factors. First, a list of potential disease risks was created based on disease testing of the captive flock, field surveys, and knowledge of potential diseases of concern in the region where reintroduction would occur. Second, disease risks were ranked based on experimental evidence of pathogenicity (the ability of an organism to cause disease), known avian pathogenicity, and evidence of exposure in captive or wild populations. Expert opinion was used if published literature was inadequate to assess risk of specific agents. Third, the likelihood and consequences of transmission were evaluated for those disease agents identified in the first two steps.

The current risk analysis has not identified potential or significant disease transmission risks from captive to wild populations, thus the risk is considered low. However, disease risk assessment, management, and monitoring would continue during all phases of the reintroduction program should it go forward.

In summary, the current overall risk of disease transmission from captive birds to wild populations, based on extensive assessment, is low. Disease monitoring and prevention plans at the SeaLife Center are in place. Maintenance of disease risk at an acceptably-low level requires regular monitoring and adapting methods throughout the project.

Genetic Management of Captive Flock

Ideally, to prevent a reduction in genetic variation and ensure the presence of locally-adapted genes, the source population would originate from the release area, and/or genetic material from the YKD population would be available for comparative analyses of the target population's

genetic diversity (Jamieson and Lacy 2012). However, this is not possible as very few Steller's eiders currently breed on the YKD. Therefore, the captive flock was derived from eggs collected on the Arctic Coastal Plain near Barrow (the only known breeding population remaining in Alaska). Future augmentation of the captive flock with males trapped on the wintering grounds may be considered to increase genetic diversity in the captive source population.

Molecular genetic techniques provide tools for monitoring levels of allelic variation in a population. The SeaLife Center, in partnership with U.S. Geological Survey Alaska Science Center, has used genotyping to compare genetic diversity of the captive population to the wild source population. Results indicate the current captive population is genetically comparable with the Alaska-breeding population on the Arctic Coastal Plain (Hollmén 2012). Only two genetic samples are available from YKD-nesting females, and we cannot draw conclusions regarding genetic structure from this small sample size. However, the genetic characteristics of the two individuals from the YKD were similar to those seen in eiders from Barrow (A. Riddle and T. Hollmén, unpublished data). Thus, we expect that the risk of reducing genetic variation in the wild population by introducing eiders raised at the SeaLife Center is minimal.

In summary, the current captive population originated from the Arctic Coastal Plain and contains comparable genetic diversity to the source population. We will continue to use tools such as pedigree analyses, genetic and physiological fitness monitoring to maintain genetic diversity of the captive flock. The risk of affecting genetic diversity of the wild population from releasing birds from the captive flock is low.

Predator management

Nest and/or duckling predation by mammalian and avian predators may hinder reintroduction efforts by reducing the survival of eggs and ducklings. The primary mammalian nest predators in the coastal zone of the YKD are foxes, although mink are present in some areas (B. McCaffery and J. Schmutz, *pers. comm.*). Avian predators include gulls and jaegers. Anthony et al. (1991) observed average rates of nest success of black brant colonies at Tutakoke River on the YKD increased from 2% and 7% in 1984 and 1985 respectively, to an average of 82% in 1986 to 1989 when fox control efforts were implemented. Based in part on this demonstrated improvement in nest success we propose to implement temporary localized predator management (lethal removal of foxes) at the release site (Kigigak Island) in 2016 to increase nest success and survival rates of released Steller's eiders. In future years, predator management may include passive predator exclusion, and/or deterrents around individual nests, or lethal removal of mammalian predators by shooting and / or trapping. The results of the 2016 pilot project and its associated predator control will be reviewed and that information in part will be used to determine if the project should be continued in the future. The number of foxes removed will be recorded, and nest cameras and observation by biologists in the field will record nest fates (hatch, predation by avian or mammalian predators etc.). Experimental work on passive exclusion of avian predators from individual nests is taking place in other areas and if successful (reduces avian predation while not resulting in nest abandonment or failure) this technique may be appropriate for use on this project in the future. Predator control efforts would be confined to the release site and be limited to the period immediately prior to, and during nesting and early brood rearing. The goal of fox control in 2016 is to remove all foxes from the 8,016 acre Kigigak Island (the release site). Based on previous fox control efforts on Kigigak Island

(McCaffrey and Fischer 2010) we estimate that <20 foxes will be lethally removed, and are unlikely to recolonize the island during the nesting and early brood rearing season. See Appendix 7 for further information on the use of predator control on Yukon Delta National Wildlife Refuge (YDNWR).

i. Community Involvement

Government-to-Government Consultation

Reintroduction may affect areas of cultural importance to Alaska Native tribes and corporations. We have, and would continue to seek input from potentially-affected groups during all phases of this program and would comply with the Department of the Interior's Government-to-Government consultation policies (see Section d). We would use written communication, in-person meetings, community meetings, and phone conversations to consult with potentially-affected parties throughout the project.

Outreach

Outreach would be a central part of a Steller's eider reintroduction effort. In order for reintroduction to be successful we would like to gain the support and participation of community members from the central coast of the YKD and their local and tribal government. We will continue our outreach efforts and to work with State and federal agencies, conservation organizations, and other non-government organizations. Our outreach objectives for the initial years include gaining support for the reintroduction program, developing effective partnerships, and engaging communities in conservation efforts. We also propose to develop communication tools and youth programs to promote reintroduction and provide additional benefits to local communities.

Frequent village visits are the most effective way for Service staff and partners to discuss the rationale, scope, and possible outcomes (biological and socioeconomic) of reintroduction, listen and understand concerns, answer questions, and receive feedback. Visits would include community gatherings and one-on-one interactions. Reintroduction messages would be shared with YDNWR Refuge Information Technicians from the local area so they can assist with village visits (to include translation as appropriate), conduct independent follow-up visits, or visit additional villages.

The establishment of a viable western Alaska subpopulation of Steller's eiders on the YKD may require developing infrastructure such as storage facilities and a base for logistics in local communities and a monitoring program to evaluate the effectiveness of the reintroduction program. Successful Steller's eider reintroduction is a long-term commitment for which we intend to maintain and grow local support. Thus, we would actively involve local residents throughout all phases of the program and make sure that concerns are understood and addressed.

ii. Compliance with Laws, Regulations, and Service Policy

We would ensure all components of the program maintain compliance with relevant statutes, regulations, and Service policies. For example, under section 7 of the ESA, we would formally consult on the effects of the Preferred Alternative on all listed species and designated critical habitat, and would comply with all terms and conditions of an incidental take statement. A

Section 10(a)(1)(A) permit under the ESA would also be required and would contain conditions to minimize impacts to Steller's eiders. Reintroduction efforts would also require compliance with provisions of the Animal Welfare Act of 1966 (7 USC 2131 and 7 CFR 2.22, 2.80, and 371.7), including a plan approved by an Institutional Animal Use and Care Committee. We would also protect cultural resources in accordance with Sections 106 and 110 of the National Historic Preservation Act of 1966, as amended (16 USC 470 and 36 CFR 800), the Antiquities Act of 1906 (16 USC 431-433), the Archaeological Resources Protection Act of 1979 (16 USC 470aa-470mm), and the Native American Graves Protection and Repatriation Act of 1990 (25 USC 3001). These statutes require federal agencies to assure undertakings on lands under their jurisdiction are surveyed, evaluated, and mitigated from disturbances. Since this activity is occurring on the YDNWR it is subject to the laws, regulations and policies for National Wildlife Refuges(NWR) in Alaska (See Appendix 7 for further details). Therefore, if we select the Preferred Alternative, the Service would comply with all applicable state and federal cultural resource statutes and policies.

e. Summary of the Preferred Alternative

The purpose of this NEPA document is to identify aspects of the biological and social environments that could be affected by reintroduction efforts. Because we are employing an adaptive management strategy, our description of the Preferred Alternative is intentionally broad in order to capture the range of possible approaches that may be applied during implementation. We anticipate that any reintroduction effort would face challenges as there is uncertainty regarding which methods would increase the prognosis for success. Learning and changing methods and approaches as a result of this learning are anticipated and are an inherent piece of adaptive management.

4. Affected Environment

The majority of effects would occur within the YDNWR on the YKD's central coast where reintroduction activities would take place (e.g., camps, release sites, holding facilities, monitoring, and travel routes). Additionally, captive-bred Steller's eider releases may occur at nearshore marine areas of Kuskokwim Shoals (Figure 4.1) or Izembek Lagoon (on the Alaska Peninsula; Figure 4.2, where significant numbers of wild Steller's eiders molt [USFWS 2001a]). Trapping of wild Steller's eider hens for use as foster hens may also occur at Kuskokwim Shoals or Izembek Lagoon. If needed, a holding facility may be constructed in Bethel, likely on Service property.

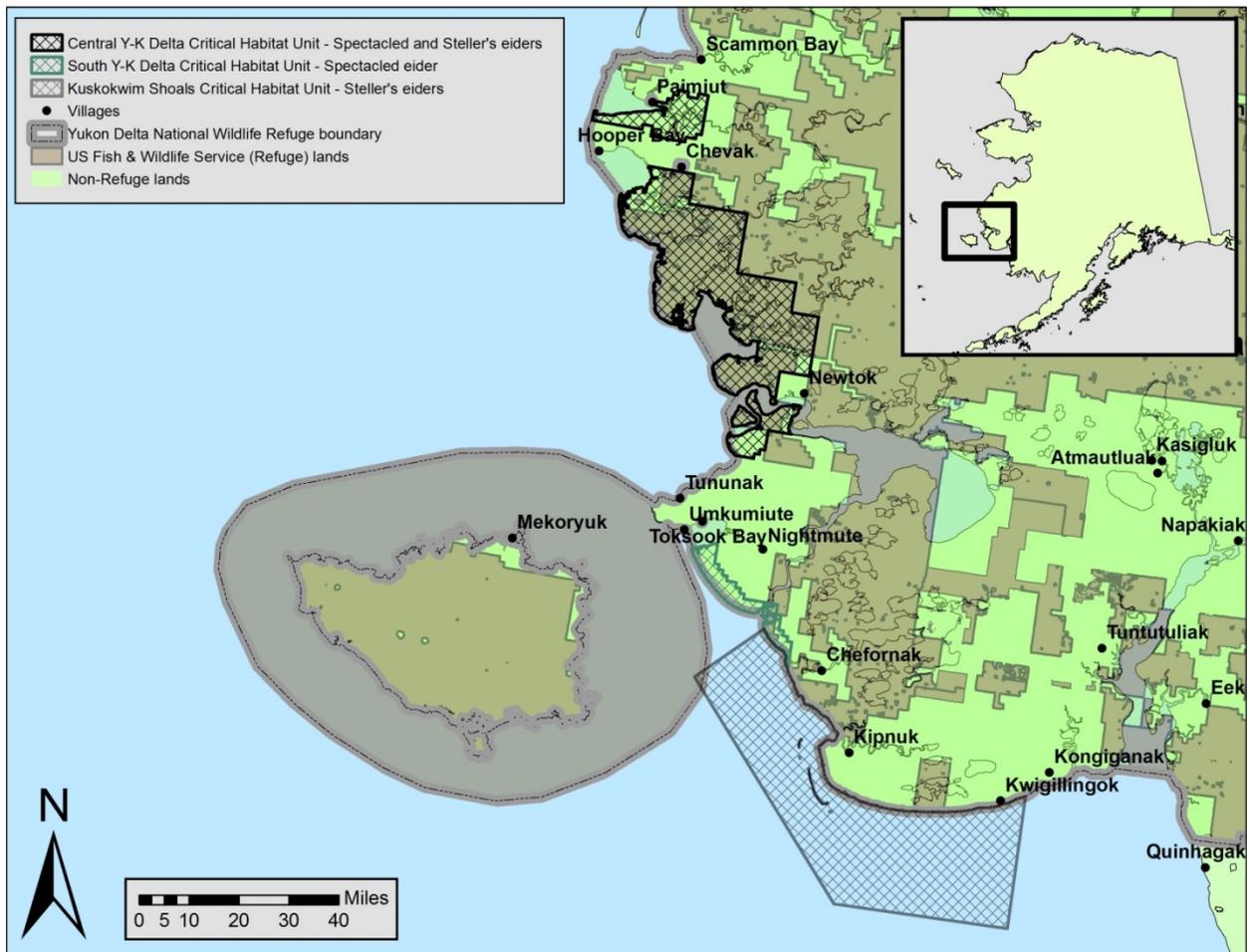


Figure 4.1. Yukon-Kuskokwim Delta and adjacent marine waters where Alaska-breeding Steller's eider reintroduction actions may occur. Map depicts villages, designated critical habitat units for Alaska-breeding Steller's eiders and spectacled eiders, and lands managed by the U.S. Fish and Wildlife Service (USFWS) and non-USFWS entities.

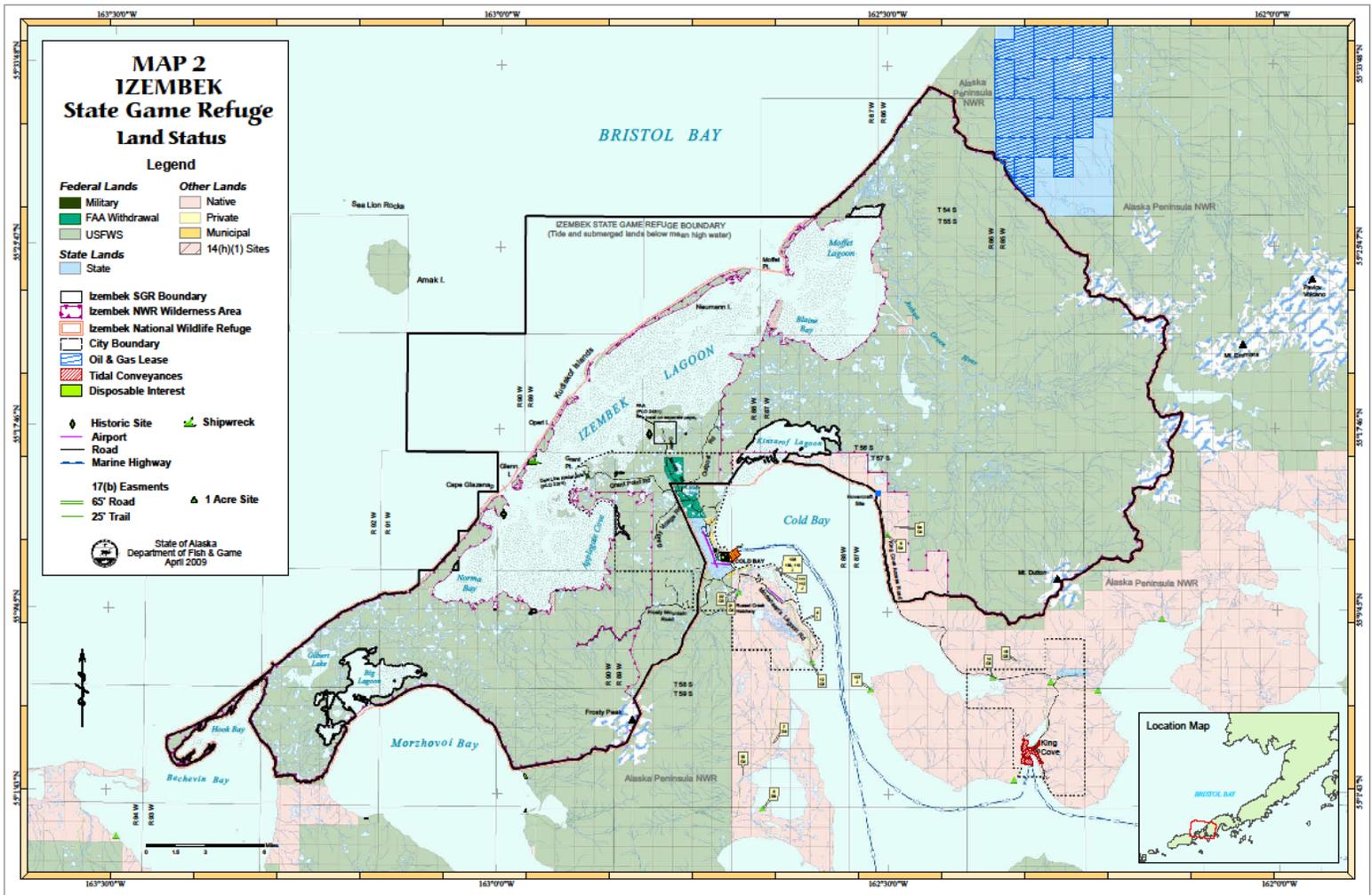


Figure 4.2. Land status map of Izembek Lagoon and surrounding area.

Outside of these areas, reintroduction actions may include aerial surveys to monitor released birds in nearshore areas of Bristol Bay, the Alaska Peninsula, lower Cook Inlet, and Kodiak Island. Aerial survey methods would be similar to ongoing surveys conducted by the Service to monitor Steller's eiders and other waterfowl species (Larned, 2005; Larned et al., 2012), and when possible, would be done in conjunction with ongoing surveys for example, Wilson et al., (2013). Surveys will be conducted using standard aerial survey methods that minimize any adverse effects to other wildlife and do not disturb subsistence users. Therefore, we do not anticipate more than a negligible effect on the biological or social environment due to aerial surveys, and they are not addressed further in this document.

A concern identified during Scoping was that the presence of reintroduced Steller's eiders could affect resource development or other human activities in areas where Steller's eiders molt and winter. However, for reintroduction to be successful, released Steller's eiders must adopt natural movement behavior of wild populations, including the use of migration routes and nesting, molting, and wintering areas currently or historically used by the wild population. We expect released eiders to use non-breeding habitats that are currently occupied by wild Steller's eiders. Thus, the presence of released birds and their offspring would not require regulatory actions beyond those that already occur due to the presence of wild Steller's eiders. No other effects to the biological or social environment at molting or wintering areas except those addressed below for Kuskokwim Shoals and Izembek Lagoon are anticipated.

Therefore, for the above reasons, we determined that effects to the human and biophysical environments of the nearshore areas of Bristol Bay, Alaska Peninsula, lower Cook Inlet, and Kodiak Island are negligible and these areas will not be considered further in this document.

Similarly, the proposed reintroduction methods are meant to encourage released eiders to return to nest on the YKD's central coast. While Steller's eiders nest on Alaska's Arctic Coastal Plain (See Section ii), we have no basis for expecting that Steller's eider females released on the YKD would recruit to the Arctic Coastal Plain subpopulation. Therefore, we anticipate no effect to the biological or social environment of the North Slope and it is not included in the Affected Environment (see Appendix 3 for definitions of terms such as "no effect").

Therefore, the Affected Environment is comprised of the following areas:

- Nearshore areas of the central coast of the YDNWR from the Askinuk Mountains to northern Nelson Island (Figure 4.1), where reintroduction actions (e.g., camps, release sites, holding facilities, monitoring, and travel routes) may occur and/or released Steller's eiders and their offspring may return to nest;
- Kuskokwim Shoals, where birds may be released or foster hens may be captured; and,
- Izembek Lagoon (Figure 4.2), where birds may be released or foster hens may be captured.

We have limited our analysis to the portions of the biological and social (human) environments that the Preferred Alternative is reasonably expected to affect. See Table 5.1 for a description of the resources that are not likely to be affected or, at most, will be affected negligibly.

a. The Yukon-Kuskokwim Delta Central Coast and Kuskokwim Shoals

i. General Description

The YKD is a vast low elevation area between the mouths of the Yukon and Kuskokwim Rivers in western Alaska. It is filled with freshwater and tidally-influenced wetlands and rivers (referred to as the intertidal zone). A more detailed description of the physical and vegetative characteristics can be found in Nowacki et al. (2000). The YKD is a globally-recognized migratory bird breeding area.

Kuskokwim Shoals is a shallow nearshore area that spans from the northern part of Kuskokwim Bay nearly to the village of Kipnuk and is used by thousands of Steller's eiders during fall molt and spring staging (USFWS 2001a).

ii. Biological Environment

Many waterbird species breed on the YKD and use tidal areas and shallow nearshore waters. Among other species, eiders (*Somateria* spp.), dabbling ducks (*Anas* spp.), diving ducks (*Aythya* spp.), cackling geese (*Branta hutchinsii*), Pacific black brant (*B. bernicla*), greater white-fronted geese (*Anser albifrons*), emperor geese (*Chen canagica*), and tundra swans (*Cygnus columbianus*) nest in the coastal zone. Shorebirds include dunlin (*Calidris alpina*), western sandpiper (*Calidris mauri*), red-necked phalarope (*Phalaropus lobatus*), whimbrels (*Numenius phaeopus*), bristle-thighed curlews (*N. tahitiensis*), bar-tailed godwits (*Limosa lapponica*), and black turnstones (*Arenaria melanocephala*). Sandhill cranes (*Grus canadensis*) are common throughout the YKD's wetlands, including along the coast. The emergent vegetation of lakes provides nesting habitat for loons (*Gavia* spp.). Many of these species use adjacent marine waters after breeding and prior to migrating to wintering areas. The threatened spectacled eider (*Somateria fischeri*) breeds and nests in the coastal intertidal zone of the YKD, and a portion of this area contains designated critical habitat for this species (USFWS 2001a, 2001b). Spectacled eiders also use the YKD's nearshore waters during migration.

The YKD also supports many species of fish, both resident species such as grayling and northern pike, and many that migrate, including whitefish and salmon species. The near shore marine environment harbors Pacific herring, halibut, and tomcod among others, and also supports a wide variety of marine mammals including several species of seal.

iii. Social Environment

Currently and historically, Yup'ik Eskimos have lived and subsisted on the YKD and within its nearshore marine waters. People living on YKD still rely on subsistence resources for cultural identity and economic sustenance. The YKD is also a mosaic of land ownership and cultural and legal institutions that influence its use, including harvest of subsistence resources. In this section, we describe cultural and subsistence resources and land management practices in areas potentially affected by reintroduction. The focus of our discussion is on subsistence resources and activities.

Subsistence Activities

All YDNWR waters and lands are open to fishing and hunting consistent with State and federal regulations; subsistence fishing and hunting on the YKD and in nearshore waters far exceeds sport fishing and hunting (USFWS 2004). The mosaic of land ownership on the YKD as well as State and federal regulations can affect the traditional subsistence practices of YKD residents. Additionally, residents travel and devote time to harvesting resources when seasons and geography make them available (Argetsinger and West 2009; West and Ross 2012). Thus, YKD residents must have knowledge of the multifaceted land ownership, regulatory, and biological setting to maintain their traditional subsistence practices. The most commonly harvested resources within the intertidal zone and from within nearshore waters are fish, marine mammals, and waterfowl (USFWS 2004; Argetsinger and West 2009; West and Ross 2012). Land mammals and plants are also important subsistence resources (USFWS 1988; West and Ross 2012). We briefly describe the harvest of these resources below.

Fish provide a primary food source for YKD residents. Subsistence harvest of salmon from YKD rivers begins in June (West and Ross 2012). Sheefish (*Stenodus nelma*) and whitefish are also harvested (West and Ross 2012) at this time. In winter, ice fishing for tomcod (*Microgadus tomcod*) and northern pike (*Esox lucius*) provides limited amounts of fresh food (West and Ross 2012). Coastal communities also harvest marine fish such as herring (*Clupea pallasii*) and starry flounder (*Platichthys stellatus*) (West and Ross 2012).

Marine mammals are an important traditional subsistence resource harvested by coastal and near-coastal communities on the YKD (Coffing et al. 1998, Ice Seal Committee 2012, West and Ross 2012). These communities frequently harvest beluga whales (*Delphinapterus leucas*), ice seals, and occasionally Pacific walrus (*Odobenus rosmarus divergens*) (USFWS 1988, West and Ross 2012). The harvest of belugas generally occurs in all months except for September and October (USFWS 1988). Seal harvest (e.g., bearded [*Erignathus barbatus*], ringed [*Phoca hispida*], and spotted [*P. largha*] seals) occurs year round but peaks in March, April, and September due to favorable ice conditions (USFWS 1988; Coffing et al. 1998; West and Ross 2012). Pacific walrus are hunted offshore, primarily in conjunction with the spring seal hunts (USFWS 1988).

Waterfowl adults and eggs are an important subsistence resource for residents living on the YKD. Subsistence hunting of adult waterfowl occurs from their arrival in spring until departure in early winter. Regulations that govern waterfowl hunting in Alaska partition the year into subsistence hunting in spring and summer, and the fall (sport) hunt in fall and winter, although residents do not recognize the separation of sport and subsistence hunts because residents continue traditional activities similarly in both seasons. Therefore, we consider all hunting as subsistence in this document regardless of season or the underlying regulatory context. Subsistence egg collection occurs early in the nesting season.

The harvest of terrestrial mammals in the intertidal zone largely consists of smaller mammals such as muskrats, mink, and foxes and generally occurs in winter (USFWS 1988).

YKD communities also harvest berries including blueberries (*Vaccinium alaskensis*), crowberries (*Empetrum nigrum*), and cloudberry (*Rubus chamaemorus*); and greens including

marsh marigold (*Caltha palustris*), wild celery (*Heracleum lanatum*), and cow parsnip (*Heracleum maximum*) (West and Ross 2012).

Resource Development

We are not aware of ongoing or pending resource development activities within the YKD's central coast zone, with the exception of commercial fishing off the coast and in the larger rivers. Commercial shipping near Kuskokwim Shoals may increase if Donlin Mine on the upper Kuskokwim River is developed.

b. Izembek Lagoon

iv. General Description

Izembek Lagoon, Moffett Lagoon, and Norma Bay (hereafter, combined as Izembek Lagoon) are shallow, productive lagoons on the north side of the Alaska Peninsula located between the Bering Sea to the northwest and lowlands of the Aleutian Mountain Range to the southeast. The lagoon is about 48 kilometers (about 30 miles) long and varies in width from 5 to 10 kilometers (about 3 to 6 miles) and contains one of the world's largest eelgrass (*Zostera marina*) beds. A description of the species occurring within the lagoon and surrounding federal, State and private lands can be found in USFWS (2013).

v. Biological Environment

Izembek Lagoon and surrounding areas are recognized as globally important for several species of waterfowl (USFWS 2013). In 1986, Izembek Lagoon was the first wetland area in the United States to be recognized as a Wetland of International Importance by the RAMSAR Convention. In 2001, Izembek National Wildlife Refuge (Izembek NWR) was also designated as a Globally Important Bird Area by the American Bird Conservancy. A large number of Steller's eiders molt in Izembek Lagoon in fall, a portion of which is possibly from the listed Alaska-breeding population; the lagoon is designated as critical habitat for this species (USFWS 2001a; USFWS 2013).

In addition to Steller's eiders, other bird species use the area, particularly in the fall. Izembek Lagoon is a key staging area for emperor geese and Pacific black brant, which graze on its extensive eelgrass beds. The area supports almost the entire population of Pacific black brant during spring and fall migration, as well as a significant portion of the population during the winter. Additionally, cackling geese use the area extensively during fall migration, foraging on eelgrass and upland berries. All three species are of conservation concern and can be sensitive to human disturbance. Other waterfowl, such as pintails, scoters, and tundra swans, and several shorebird, seabird, and raptor species, also use the area during the fall (USFWS 2013).

vi. Social Environment

Izembek Lagoon is located within the boundaries of Izembek NWR, and the submerged lands and waters within the lagoon are managed by the State of Alaska as Izembek State Game Refuge. The nearest human settlement is the city of Cold Bay located 13 kilometers (8 miles) southeast of the lagoon. Public use activities include scientific research, tourism, beach combing, and subsistence activities, but a primary use in Izembek Lagoon is fall waterfowl hunting (September – November; USFWS 2013).

5. Environmental Consequences, including Cumulative Effects

The purpose of this section is to identify and describe potential environmental effects on the biological and social environments that could result from implementing the two proposed alternatives.

a. No Action Alternative

Because reestablishing a viable western Alaska subpopulation of breeding Steller's eiders on the YKD is a criterion for delisting, selecting the No-Action Alternative will likely prevent the Service from achieving recovery criteria and delisting this species.

i. Biological Environment

Selecting the No-Action Alternative would have no effect on the biological environment. Without reintroduction efforts, Steller's eiders will likely continue breeding only infrequently on the YKD and may become absent entirely from the area.

ii. Social Environment

Selecting the No-Action Alternative would have no effect on cultural and historic resources or on human activities described in the Affected Environment. The Service would not provide additional outreach, education, or employment opportunities in communities on the YKD related to reintroduction.

iii. Cumulative Effects

Selecting the no-action alternative is not anticipated to result in cumulative impacts. However, as with the no action alternative the current protections under the ESA and the Migratory Bird Treaty Act would remain in place because a population increase needed to reach recovery criteria would be unlikely without reintroduction efforts.

b. Preferred Alternative

During this analysis we sought to identify all potential effects, and then determine which should be further analyzed due the intensity, duration, or scale of the effect, or the level of concern expressed by stakeholders during the Scoping process (See Appendix 3 for definitions). Table 5.1 lists the potential impacts eliminated from further analysis due to little or no effect and provides a justification for their elimination. Here we then describe the possible effects that have a greater potential to affect the environment:

- 1) Effects to the extant wild Steller's eider population through changes in genetic diversity, disease, disturbance, and the potential for reintroduction to aid in recovery of the population;
- 2) Effects to other bird species within the Affected Environment through increased disease risk or disturbance during reintroduction activities; and,
- 3) Effects to the social environment, including how reintroduction activities and/or presence of reintroduced birds would affect subsistence activities, sport hunting, and resource development.

Table 5.1. Potential effects of the Preferred Alternative to the biological and social environment that were eliminated from further analysis because of minor importance.

Resource	Potential impact and justification for elimination
Physical Environment	We do not expect ground disturbance in association with reintroduction, with the possible exception of constructing a holding facility in Bethel. The facility, if constructed, is likely to be in an area that is already developed.
Terrestrial Mammals	Large mammals are not commonly present in coastal zone of YKD and no effects to them are anticipated. Effects to small mammals such as voles during reintroduction actions would be minor, short-term, and site-specific. A high density of brown bears can be found along the outer edges of Izembek Lagoon in fall, including near the boat launch and tidal areas where duck traps may be set. Bears will be avoided and effects are likely to be negligible from these short-term activities. Foxes will be killed if predator control is implemented. The effects of predator control are described more fully elsewhere in this document.
Marine Mammals	It is possible that marine mammals, including northern sea otters, seals, killer whales, gray whales, Steller sea lions, and walrus could be encountered when boating at Izembek Lagoon and Kuskokwim Shoals. However, reintroduction activities would have at most negligible effects to the above mammals because measures will be taken to avoid them, and activities will be of short duration.
Fish	Small watercraft may be used for transportation along major and minor waterways to camp sites and field sites, but this boating is unlikely to affect fish.
Listed Species	Reintroduction actions would be evaluated through section 7 consultation to ensure that any potential effects to listed species are minimized (see also Section ii for discussion of spectacled eiders).
Captive reservoir population of Steller's eiders at the SeaLife Center	We expect no negative effect to the captive flock. Eggs and ducklings produced from the reservoir flock are likely to be used for reintroduction (not adult members of the flock). The flock would be maintained at numbers necessary to preserve genetic diversity, and methods would be reviewed by an animal care and use committee.
Cultural/Historic Resources	We expect no effect on known cultural or historic resources because we would avoid conducting reintroduction actions near these resources and would consult with the Regional Historic Preservation Officer to ensure compliance with all applicable laws. If cultural resources are found, we expect negligible impacts on newly-discovered cultural or historic resources because we can relocate our actions.

Resource	Potential impact and justification for elimination
Private Property Rights/Land Use	We intend to carry out all reintroduction actions on Refuge land or in State waters that provide public access. We recognize the patchwork of land ownership requires consulting with Refuge staff and local experts to ensure we do not inadvertently trespass onto private land. We will pursue all required special use permits. Thus we expect no effect to private property rights.
Sport Hunting on the YKD	Sport hunting and fishing occurs rarely on the central coast of the YKD. Hunting and fishing on the YKD where reintroduction activities may occur consists primarily of subsistence activities rather than sport hunting; thus, reintroduction actions are unlikely to affect sport hunting. We address effects to subsistence activities later in this document.
Other uses of the YKD	The majority of Refuge-permitted activities involve avian research. At most a negligible effect is expected because we intend to communicate with researchers to minimize interference. Recreational users are rare in the coastal zone; if they are encountered we expect our actions would have no effect.
Local Economies	We expect this action to have a positive but minor effect on the local economy by providing education and employment opportunities as well as the purchase of supplies and services from the communities on the YKD and Cold Bay. If constructed, a holding facility in Bethel would create short-term construction jobs as well as some longer-term employment.
Sport and Subsistence Activities at Izembek Lagoon	Subsistence activities of Cold Bay and King Cove residents, including fishing at creeks/ivers that flow into Izembek Lagoon, and waterfowl hunting, may occur at the same time as reintroduction activities. Because it is difficult to distinguish between sport and subsistence hunting, and sport hunting is a significant activity in the fall at Izembek Lagoon, we consider waterfowl harvest at Izembek Lagoon in this document as sport hunting. Other subsistence activities are unlikely to overlap with the short-term, temporary reintroduction activities, but refuge personnel, communities, and Tribal governments will be consulted to ensure that is the case.
Other uses of Izembek Lagoon	Other uses of Izembek Lagoon include avian research, tourism, and beach combing (USFWS 2013). Some tourist and outreach activity occurs near Grant Point where watercraft would be launched for reintroduction activities. However, boating activities associated with reintroduction in Izembek Lagoon would occur so infrequently they are unlikely to overlap with other activities.

iv. Biological Environment

In this section we describe the potential effects to the biological environment, including the extant wild population of Steller's eiders and other bird species that use the Affected Environment.

Vegetation

Short-term, high-intensity site-specific impacts to vegetation may occur during on-the-ground activities such as those occurring at camp and release sites. The area affected by these activities will be small (likely <1 acre). Vegetation would recover naturally upon project closedown, but depending on the number of years specific sites are occupied, recovery of these small areas could take years.

Disease and Genetic Risk

In 2009, the Team identified and recommended evaluation of critical risk factors that could negatively affect the wild Steller's eider population or other bird species, including the potential introduction of disease and the potential loss of genetic diversity in the captive source population. Both have been evaluated through formal risk analyses conducted by the SeaLife Center (Section d). Results indicate that the current overall risk of disease transmission to wild populations from captive birds which are held in a facility with very high biosecurity standards is low. If Steller's eiders are reintroduced, the Service would regularly monitor bird health throughout all phases of the program and implement additional, or change protocols if needed to minimize disease risk.

Similarly, the current captive population originated from the Arctic Coastal Plain and contains comparable genetic diversity to the source population; therefore, we expect that releasing progeny from the captive population will not result in a decrease in genetic diversity of the natural population. Tools such as pedigree analyses, genetic and physiological fitness monitoring would continue to be used to maintain genetic diversity of the captive flock, should the Preferred Alternative be selected (Section d).

Disturbance

It is possible that certain reintroduction methods could disturb wild Steller's eiders. Such disturbance could occur while capturing wild hens, releasing captive-reared birds to the molting areas, during nest/brood augmentation, and during monitoring.

To implement the foster hen release method, a small number of Steller's eider hens would be captured annually while flightless at molting areas of Kuskokwim Shoals or Izembek Lagoon and held in captivity over winter. Capture would involve methods similar to those used during Steller's eider banding drives for several years at Izembek and Nelson lagoons (see Dau et al. 2000 for more detailed description of methods). However, fewer birds would be captured to implement this method than were captured during banding drives. Capturing small numbers of female Steller's eiders annually is unlikely to have population-level effects on the Pacific population. Additionally, only a small proportion (<1%) of individuals at Kuskokwim Shoals or Izembek Lagoon are thought to be from the listed Alaska-breeding population; thus, it is unlikely that a member of the listed population will be captured. Other bird species may be disturbed during these activities, but they will likely move to other areas of the lagoon, and displacement

would be short-term. Thus, we do not expect that disturbance of Steller's eiders would have population-level effects.

Likewise, we expect that disturbance to Steller's eiders would be minimal if there are releases of captive-raised birds to molting grounds. This method would involve releasing birds from boats or possibly from a float plane. The presence of these vehicles would likely disturb wild Steller's eiders, flushing them from the immediate area. Efforts to minimize this disturbance such as reducing the speed of vehicles and limiting the number of trips and time spent in the area would be implemented. In addition, we would attempt to spend as little time in the area as possible so released birds can acclimatize to the area, begin mixing with wild flocks, and acquire natural fear of humans and predators.

We may augment the nests of wild Steller's eiders on the YKD with eggs produced at the SeaLife Center. We do not expect to find many wild Steller's eiders nesting because they nest on the YKD so rarely. However, if wild Steller's eiders nests are found, females may be flushed from or temporarily prevented from returning to their nests. In rare instances, females may abandon their nests and eggs. Also, females may expend energy raising additional young. The Service currently conducts research on Steller's eiders in the Barrow area, and field crews on the YKD would use standard operating procedures (see Appendix 4: Example Minimization Measures from Barrow Eider Project) that include minimization measures successfully developed during the Barrow study. Additionally, field crews would adhere to conditions of all necessary permits. Therefore, we expect that impacts to individual wild Steller's eiders on the YKD would be of moderate intensity and duration.

As described in Section d, we may conduct aerial monitoring on the YKD, the migratory route, and molting and wintering areas. These surveys may disturb listed eiders and other waterfowl in an area. The severity of disturbance depends on the duration, frequency, and timing of the action causing the disturbance. Disturbance can result in changes to behavior (e.g., flushing or diving) and prolonged disturbance can displace birds from their preferred habitats. However, the monitoring activities would be of short duration and infrequent, such that any disturbance will have a negligible effect on wild Steller's eiders.

Potential contribution to Steller's eider recovery

The purpose of the Preferred Alternative is to re-establish a western Alaska subpopulation that is essential to the recovery of the listed Alaska-breeding population. However, we are uncertain how successful reintroduction may be at accomplishing this goal. In this section, we briefly describe the uncertainties related to reintroduction to provide context regarding the potential for a positive effect on the Alaska-breeding population.

Over the last several years, the Team helped the Service identify factors potentially affecting the success of reintroduction efforts. Key uncertainties include:

- Historical distribution and abundance of Steller's eiders on the YKD are unknown.
 - No population surveys were conducted prior to decline, and information is primarily limited to anecdotal observations and limited sampling efforts.
- Causes of decline are unknown.

- Causes may have included changes in community ecology (concurrent goose population declines and subsequent prey switching by fox, changes in pond productivity), ingestion of spent lead shot, increased harvest, and changes in the marine environment.
- Retrospective analyses to test these hypotheses are not possible.
- Because original causes of decline are unknown, we cannot be certain that potential constraints to population re-establishment have been ameliorated.
- Potential future changes in the habitat's capability to support Steller's eiders are difficult to predict.
 - Climate change is likely to impact waterfowl habitat through increased storm surges, increased salinity in the intertidal zone, melting of permafrost, and vegetation change.
- The proportion of birds released on the YKD that will return upon reaching breeding age (natal philopatry) is unknown.

Two factors that may affect success warrant further discussion given the concerns raised by stakeholders during Scoping (see Section e): predation risk and contamination from ingestion of spent lead shot.

Predation risk

Both avian and mammalian predators are known to have significant negative influence on the survival and productivity of ground nesting birds such as geese and eiders (Gotmark and Ahlund 1988; Anthony et al. 1991). During reintroduction predators could prey upon reintroduced Steller's eiders eggs and ducklings significantly reducing their survival. The primary mammalian nest predators in the coastal zone of the YKD are foxes, although mink are present in some areas (B. McCaffery *pers. comm.*; J. Schmutz, *pers. comm.*; Fischer and Stehn 2014; Norment et al. 2015).

Anthony et al. (1991) observed a “dramatic improvement of nest success (of black brant) following the removal of arctic foxes at Tutakoke River” (on the central coast of the YKD) and Wilson (2007) in her studies of common eiders on the YKD concluded that enhanced protection through predator management during the early nesting period may be an effective management strategy for increasing reproductive success. Removal of small numbers of foxes from discrete areas, such as at goose breeding colonies, has been conducted successfully to increase reproductive success and recruitment at several sites on the YKD (Anthony et al., 1991; Lake et al., 2006; Lake et al. 2007).

Small scale (short duration and limited to the release sites) predator management may take place to reduce predation risk and hence increase egg and duckling survival of released Steller's eiders. Some predator management efforts such as exclosures or deterrents that cover and protect individual nests by displacing or deterring avian and mammalian predators would have only minor, extremely localized effects on vegetation and no significant adverse effects to birds and mammals (other than preventing depredation of Steller's eiders).

Trapping or shooting efforts, could have a minor effect on species in a localized area (<10,000 acres) at the reintroduction site. Nesting birds may be disturbed while traps are checked, but trappers would follow standard operating procedures that include minimization measures,

including locating traps >200m away from known nests to prevent disturbing an incubating hen, and not remaining in an area for a long period of time allowing any birds which have been flushed to quickly return to her nest. Predators such as foxes and possibly mink would die if lethal predator control for these species was implemented.

While the YKD is open to hunting and trapping during federal and state regulated seasons, mammalian predators could be lethally taken by shooting and or trapping immediately prior to and during the nesting and early brood rearing period in a more localized project area. In addition to the temporal limits, lethal removal of mammalian predators would be limited to the area immediately adjacent to the release site. For example, lethal removal of foxes would be limited to the 8,031 acres of Kigigak Island itself where the releases would take place. Based on previous predator control work on the YKD to protect brant colonies, we estimate <20 foxes would be removed each year (Lake et al., 2006; Lake et.al., 2007; McCaffery and Fischer 2010). Given the relatively low number of animals which would be lethally removed, the limited spatial extent of any predator control efforts (<10,000 acres), and the short duration of the effort (limited to a few weeks), impacts to the fox population would be localized and temporary in nature. Further arctic foxes are highly mobile, have a very high fecundity, and naturally experience significant fluctuations in their populations (Anthony et al. 1991; Fide et al., 2012; Anthony 1997). Therefore, we anticipate they will rapidly recolonize the release site once control efforts have ceased. All regulatory requirements including permits from the State of Alaska Department of Fish and Game (ADFG) and the YDNWR and any associated mitigation recommended by the permitting agencies to reduce impacts to non-target species will be met before implementing this management action.

Contaminant Risk

For several decades, waterfowl and small game hunting resulted in the deposition of spent lead shot into wetlands on the YKD, especially near villages. The use of lead shot for hunting waterfowl has been illegal since 1991 in Alaska (50 CFR §20.102), and the Alaska Board of Game, at the request of regional advisory committees, passed regulations that prohibit the use of lead shot for all bird and small game hunting on the YKD. Opportunistic examination of spent shell casings, ammunition of hunters, and store shelves has revealed relatively few violations of this prohibition, indicating outreach, education, and enforcement efforts are having a positive effect. However, permafrost under shallow water bodies on the YKD contributes to the persistence and availability of lead pellets for years after deposition (Flint and Schamber 2010).

Steller's eiders on the YKD, particularly breeding hens and young birds that forage in shallow tundra ponds might ingest spent lead shot (Flint et al. 1997). The toxic effect of lead poisoning includes lethal and sublethal effects (Bellrose 1959; Eisler 1988). Observed geographic variation in spectacled eider survival on the YKD may be explained by variation in lead exposure (Grand et al. 1998, re-analysis by Anderson et al. 2000). Similar rates of exposure have been found in long-tailed ducks (*Clangula hyemalis*) on the YKD (Flint et al. 1997). The probability of lead exposure in spectacled eiders on the YKD is related to distance from villages and access routes to hunting areas, such as major rivers and sloughs (Petersen et al. 2012). Potential exposure, particularly at/near potential release sites, will be evaluated as part of final site selection to minimize the potential for exposure.

In summary, these uncertainties make assessing the likelihood of success of reintroduction difficult. However, the Team and Service believe that re-establishment of a viable subpopulation in western Alaska is unlikely without reintroduction. No other plausible alternatives have been identified.

Other Bird Species

Reintroduced Steller's eiders would have a negligible impact on other YKD wildlife; they are unlikely to displace other birds nesting on the YKD or compete with them for other resources such as food. Implementation of the Preferred Alternative could affect other bird species through disturbance or through potential disease transmission, and some methods, such as using wild females of other waterfowl species as surrogate mothers for Steller's eider clutches, could have direct impacts to small numbers of those species. We evaluate those impacts in the following sections.

Disturbance

Reintroduction actions may disturb some nesting birds of other species in a small area of the YKD. Incubating females may be flushed or temporarily prevented from returning to their nests. In most cases, females would return to their nests and continue incubation. In rare instances, females may abandon nests and eggs, or nests/eggs could be depredated while the female is absent (Gotmark and Ahlund 1988). We would incorporate best practices commonly used in waterfowl nest studies to minimize nest disturbance and will adhere to conditions of all permits (see Appendix 4). Fieldwork would occur over a relatively small area of the YKD or nearshore waters. Because we expect behavioral responses would occur over a very small area and to be minor in scale and short in duration, we expect disturbance to cause only minor effects to a few individuals. While, in summary, we expect only minor, localized effects to birds, we also address the concern that disturbance may affect subsistence use of these species in Section v below.

Spectacled eiders, also listed as threatened under the ESA, nest near reintroduction sites on the YKD. The Service would consult under section 7 and minimize disturbance by employing terms and conditions currently required of other researchers in the area.

Activities such as release of captive birds and capture of foster hens at Kuskokwim Shoals and Izembek Lagoon, as described above, may temporarily disturb other waterfowl and shorebirds. These birds are likely to be displaced for a short amount of time, but as with Steller's eiders, we do not expect disturbance associated with these capture efforts to cause population-level effects.

Disease

The Team considered disease risk to other birds as a critical factor that had to be adequately minimized prior to releasing captive-raised Steller's eiders. This is particularly important when releasing captive-reared birds to an area as important to waterfowl and shorebird populations as the YKD. As described above, the risk of disease has been evaluated through a formal risk analysis conducted by the SeaLife Center (Section iv). Results indicate that the current overall risk of disease transmission from captive birds to wild populations is low. If Steller's eiders are

reintroduced, the Service would regularly monitor and adapt protocols at all levels and phases of the program to minimize disease risk. Therefore, we expect effects to wild birds from disease to be negligible and manageable.

Nest Success

One method being considered is to use hens of other waterfowl species nesting on the YKD as surrogate mothers for Steller's eiders. This method could involve replacing clutches of common eider, greater scaup, northern pintail, or other waterfowl with Steller's eider eggs. This method would reduce the reproductive success of the surrogate mother, as these eggs would not hatch. One egg from each surrogate nest will be collected and cataloged. Beyond those collected for study, additional eggs removed from the surrogate clutches will be destroyed and disposed of in the field in a location that will not attract predators, such as the river or large slough on an outgoing tide, or hauled back to Bethel with trash and be disposed at the landfill.

However, given the population sizes of potential surrogate species on the YKD (multiple thousands of individuals) the loss of a low number of clutches (likely 10s at most on an annual basis) if this method is used is expected to have negligible population-level impacts.

Summary of Biological Environment Impacts

In summary, we expect only minor impacts of the Preferred Alternative on the biological environment of the YKD, Kuskokwim Shoals, and Izembek Lagoon through short-term, minor disturbance, a negligible increase of disease transmission risk to other bird species, and possible reduction in reproductive success of a low number of females of other waterfowl species if a surrogate mother approach is implemented. Our intent is that reintroduction will have long-term, positive impacts to the Affected Environment and will not result in significant negative effects. If successful, the Preferred Alternative would establish a viable population of Steller's eiders on the YKD.

v. Social Environment

Reintroduction could impact the social environment by potentially affecting opportunities to: 1) conduct subsistence activities; 2) sport hunt; and/or 3) develop natural resources.

Subsistence Activities

Subsistence activities could be indirectly impacted by affecting subsistence resources, thereby making them unavailable for harvest, and/or they could be directly impacted by affecting the ability of subsistence users to conduct activities normally (for example, the presence of researchers could discourage hunters from using traditional areas). The greatest impact is likely to occur at sites on the YKD's central coast on YDNWR land. Some impacts could also occur at Kuskokwim Shoals and/or Izembek Lagoon during capture and release activities, but reintroduction activities will be of such short duration and intensity at those locations that the effect on subsistence activities is likely to be negligible.

We addressed the potential indirect impacts (for example, potential disease transmission or disturbance on other birds) in Section iv above. However, we recognize that subsistence users may have different perspectives and may disagree with our assessment that impacts to wildlife and other resources are likely to be minor, at most. Therefore, we propose to address these concerns in two ways: 1) continue to coordinate with local subsistence users to better understand

any concerns; and 2) use that information to minimize impacts whenever possible. Our efforts to work with local subsistence users will be on-going throughout the project and will not be accomplished solely through this NEPA analysis.

Concerns about direct impacts can be divided into two categories. First, spatial and temporal overlap of reintroduction and subsistence use may discourage subsistence users from their normal activities. Second, some stakeholders are concerned that increasing the number of Steller's eiders would increase the likelihood of a local hunter accidentally shooting one, resulting in prosecution for harvesting a closed species.

Reintroduction activities could overlap with subsistence activities in the spring and summer during harvest of adult waterfowl and eggs, and during movement to and from fish camps along the YKD's central coast. However, reintroduction actions would occur on a very small scale relative to subsistence harvesting. We would carry out actions or camp at one or two sites annually and walk across the tundra on foot in a relatively small area. We would travel primarily by boat to conduct these activities, and use aircraft during set-up and take-down of camps and re-supply of food or equipment. These activities are very similar to research activities which have been conducted in the area for many years and which have not resulted in conflicts with subsistence practices or users. The Service would consult with local community members and Refuge staff to devise measures to avoid impacting areas traditionally used to harvest subsistence resources. Because of the small scale of the reintroduction activities, our commitment to consult with local users, and based on past experience we expect that reintroduction actions would have no more than a minor impact on subsistence activities on the YKD.

During Scoping, some stakeholders expressed concern about the potential for subsistence hunters to accidentally shoot a reintroduced Steller's eider. Specifically, local residents, the Association of Village Council Presidents, the Alaska Migratory Bird Co-Management Council, and the ADFG were concerned that an accidental shooting would result in citations, forfeiture of hunting equipment, and increased law enforcement actions in the area. While the level of stakeholder concern is significant, the actual risk is low. If reintroduction efforts are successful, Steller's eider abundance on the YKD and in nearshore waters would still be low relative to other waterfowl; thus, we expect the likelihood of hunters accidentally shooting Steller's eiders is negligible. The Service does not expect to increase law enforcement efforts in conjunction with reintroduction, promulgate new regulations, or close areas used for subsistence. However, if a Steller's eider is shot, law enforcement measures would take place.

There is a negligible chance that a Steller's eider would be shot, but the concern is real and we take it seriously. Therefore, to minimize the risk as much as possible, we plan to conduct extensive outreach in nearby villages (in collaboration with village organizations and local hunters; Section d) to increase awareness of hunting regulations and current reintroduction activities and improve species identification.

Public comments included a suggestion to designate the reintroduced population as a "non-essential experimental population" under Section 10(j) of the ESA (discussed below), and to promulgate a special management rule under Section 4(d) to allow or legal subsistence harvest of reintroduced birds. However, subsistence harvest of Steller's eiders by Alaska Natives or any

non-native permanent resident of an Alaska Native village is not prohibited under the ESA (see Section 10(e)). Steller's eiders *are* closed to harvest under the Migratory Bird Treaty Act (MBTA); thus, any regulatory change to legalize Steller's eiders for harvest would have to be accomplished through MBTA regulations, rather than through a special rule under the ESA.

In summary, our intent is to minimize the chances of negative impacts (e.g., disturbance of subsistence activities, or accidental shooting of Steller's eiders) from occurring by working with local communities to ensure our presence on the YKD is welcomed (e.g., communicating with local hunters, hiring local students, etc.). Because of the small-scale of reintroduction activities, the low likelihood that a reintroduced Steller's eider will be shot, and the Service's commitment to conduct outreach to minimize risk, we expect the impact to subsistence users to be minor. Please note that we do not intend to address these issues solely through the NEPA process represented here; communication and collaboration with subsistence users is necessary for success and would continue throughout the reintroduction project, should it go forward.

Resource Development

Public comments included concerns about increased regulation and effects to resource development due to reintroduction activities (and presence of released birds; see Section f). We are not aware of proposed or current resource development activities on the YKD's central coast. Due to their short duration, we do not expect reintroduction activities at Kuskokwim Shoals or Izembek Lagoon to affect potential resource development.

The Service has designated several reintroduced populations of listed species as "non-essential experimental" under Section 10(j) of the ESA to reduce the requirements of section 7 and alleviate public concerns about the presence of a reintroduced listed species (e.g., as for the Aplomado falcon and whooping crane). However, this designation does not change the requirements of section 7 on Refuge lands. This designation also requires the reintroduced population to be wholly separate from the wild population. As the goal of reintroduction is for reintroduced birds to use the same molting and wintering grounds as wild Steller's eiders (and thus they will not be wholly separate), a 10(j) rule cannot be promulgated for Steller's eiders. However, we expect no additional need for section 7 consultation or other regulation to development activities due to reintroduction because these areas are already used by wild Steller's eiders (and the far more numerous threatened spectacled eider) so Federally-funded or permitted development activities already require section 7 consultation.

In summary, we expect no effect on resource development from the Preferred Alternative.

Sport Hunting

Sport hunting of waterfowl (primarily geese) at Izembek Lagoon occurs mostly September through November (USFWS 2013). Thus, hunting activities overlap with the potential capture of foster hens and release of captive-bred birds in the area. To avoid conflict with hunters, we will communicate with Izembek NWR and the ADFG staff, as well as hunting guides and lodges, about our proposed activities. Because our actions will be of short duration and intensity, we expect at most negligible impacts to sport hunting activities at Izembek Lagoon.

Summary of Social Environment Impacts

In summary, we expect the Preferred Alternative would have, at most, minor negative impacts on the social environment of the YKD through potential impacts to subsistence activities, and negligible impacts to the social environment of Kuskokwim Shoals and Izembek Lagoon through impacts to sport hunting and resource development. Possible positive impacts include helping recovery of Alaska-breeding Steller's eiders, hopefully contributing to eventual delisting of the species, and contributing to economic and educational opportunities in villages on the YKD.

vi. Cumulative Effects

The Preferred Alternative would result in minimal cumulative effects. Over time, the Service would discontinue on-the-ground reintroduction fieldwork with the exception that if reintroduction is successful, the Service may maintain a presence on the YKD to promote conservation efforts and to monitor this population. While preventing impacts to subsistence activities will require extensive communication and outreach, we anticipate overall positive effects of restoring the Steller's eider to the YKD as we improve our working relationships with local residents and provide economic opportunities through local hires and purchases of goods and services.

The YKD is likely to be affected by global climate change. Alaska's average annual statewide temperatures have increased by almost 4°F from 1949 to 2005, with significant spatial variability across the expanse of the State (Markon et al. 2012). Climate change contributes to melting glaciers, melting polar ice, rising sea levels, increased storm intensity, and coastal flooding. These factors could affect species distributions and abundances. For example, sea level rise could lead to saltwater intrusion into YKD freshwater wetlands, altering their suitability for current plant and animal associations. Climate change may be causing changes on the YKD and other portions of the Affected Environment, but uncertainty prevents us from predicting the extent of such changes. We are also uncertain how climate change would impact reintroduction efforts, but plan to use adaptive management strategies to respond to possible environmental changes caused by climate change.

6. Conclusion of the EA

This EA is intended to assist the Service in determining if reintroducing Steller's eiders to the YKD (the Preferred Alternative) would result in significant impacts to the environment. This analysis indicates that while some minor positive and negative impacts to the biological and social environment may occur, no significant impacts are expected if the Preferred Alternative is selected.

The purpose of reintroducing the species to the YKD is to assist in the recovery of the Alaska-breeding population of Steller's eiders by reestablishing a breeding population in western Alaska. Without reintroduction, the western Alaska subpopulation is not likely to increase, leaving the extant threatened population more vulnerable to extirpation. The Service, then, would be unlikely to meet the established recovery criteria (USFWS 2002) for this species. Therefore, the Service recommends implementing the Preferred Alternative.

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8. Appendix 1: Individuals and Entities Contacted During Scoping

The individuals, agencies, conservation groups, landowners, Alaska congressional delegation, local governments, and Alaska Native corporations, non-profit organizations and tribes listed below were sent an invitation to provide comments.

Agdaagux Tribe of King Cove	Koniag Incorporated
Akhiok-Kaguyak, Incorporated	Kugkaktlik Ltd.
Alaska Department of Environmental Conservation	Kuitsarak, Incorporated
Alaska Department of Fish & Game	Kuitsarak, Incorporated
Alaska SeaLife Center	Kuukpik Corporation
Aleut Corporation	Kwik, Incorporated
Aleutian Bering Sea Islands LCC	Lake & Peninsula Borough
Aleutians East Borough	Leisnoi, Incorporated
Aleutian Pribilof Islands Association, Incorporated	Manokotak Village
Arctic Slope Native Association	Naknek Native Village
Arctic Slope Regional Corporation	National Fish and Wildlife Foundation
Arviq Incorporated	National Marine Fisheries Service
Arviq, Inc.	National Park Service
Askinuk Corporation	Native Village of Akhiok
Association of Village Council Presidents	Native Village of Akutan
Atqasuk Corporation	Native Village of Barrow Inupiat Traditional Government
Atqasuk Village	Native Village of Belkofski
Audubon Alaska	Native Village of Chignik Lagoon
Becharof Corporation	Native Village of Ekuk

Belkofski Corporation	Native Village of False Pass
Bethel Native Corporation	Native Village of Goodnews Bay
Bristol Bay Borough	Native Village of Hooper Bay
Bristol Bay Native Association, Incorporated	Native Village of Kipnuk
Bristol Bay Native Corporation	Native Village of Kongiganak
Bureau of Land Management	Native Village of Kwigillingok
Bureau of Ocean and Energy Management	Native Village of Mekoryuk
Calista Corporation, Lands & Natural Resources Dept.	Native Village of Nelson Lagoon
Center for Biological Diversity	Native Village of Nightmute
Chaluka Corporation	Native Village of Nikolski
Chefarnrmute Inc.	Native Village of Nuiqsut
Chevak Company Corporation	Native Village of Paimiut
Chevak Native Village	Native Village of Pilot Point
Chignik Bay Tribal Council	Native Village of Port Heiden
Chignik Lagoon Native Corporation	Native Village of Quinhagak
Chinuruk Incorporated	Native Village of Scammon Bay
Choggiung Limited	Native Village of Tununak
City of Akhiok	Native Village of Unga
City of Akutan	Natives of Kodiak, Incorporated
City of Atqasuk	Nelson Lagoon Corporation
City of Barrow	Newtok Traditional Council
City of Chefornak	Newtok Village Corporation
City of Chevak	Nima Corporation
City of Chignik	Ninilchik Natives Association,

	Incorporated
City of Clark's Point	Ninilchik Village
City of Cold Bay	North Slope Borough
City of Dillingham	North Slope Borough Dept. of Wildlife Management
City of Egegik	Nunakauiak Yupik Corporation
City of False Pass	Nunakauyarmiut Tribe
City of Goodnews Bay	Olgoonik Corporation
City of Homer	Orutsararmiut Native Council
City of Hooper Bay	Ounalashka Corporation
City of King Cove	Paimiut Corporation
City of Kodiak	Paug-Vik Incorporated, Limited
City of Manokotak	Pauloff Harbor Tribal Council
City of Mekoryuk	Pilot Point Native Corporation
City of Nightmute	Platinum Traditional Village
City of Nuiqsut	Qagan Tayagungin Tribal Council
City of Pilot Point	Qanirtuuq Inc.
City of Platinum	Qawalangin Tribe of Unalaska
City of Port Heiden	Qemirtalek Coast Corporation
City of Quinhagak	Saguyak Incorporated
City of Sand Point	SeaLion Corporation
City of Scammon Bay	Senator Lisa Murkowski
City of Togiak	Senator Mark Begich
City of Toksook Bay	Shumagin Corporation
City of Unalaska	Sierra Club

City of Wainwright	Sun'aq Tribe of Kodiak
Congressman Don Young	Tangirnaq Native Village
Cook Inlet Region Incorporated	The Akutan Corporation
Cook Inlet Tribal Council, Incorporated	The King Cove Corporation
Curyung Tribal Council	Togiak Natives Limited
Defenders of Wildlife	Traditional Village of Togiak
Ducks Unlimited Alaska	Tununrmiut Rinit Corporation
Eastern Aleutian Tribes, Incorporated	Ukpeagvik Inupiat Corporation
Egegik Village	US Army Corps of Engineers
Environmental Protection Agency	US Geological Survey
Far West, Incorporated	Village of Chefnak
Friends of Alaska National Wildlife Refuges	Village of Clarks Point
Inupiat Community of the Arctic Slope	Village of Wainwright
Isanotski Corporation	Western Alaska LCC
Kaguyak Village	Wildlife Conservation Society
Kenai Peninsula Borough	Yukon-Kuskokwim Delta Subsistence Regional Advisory Council
Kodiak Island Borough	

9. Appendix 2: Current and Past Eider Recovery Team Members

Current Members

Name	Affiliation
Shannon Atkinson	School of Fisheries and Ocean Sciences, University of Alaska Fairbanks, Fisheries Division
Chris Dau	Service, Migratory Bird Management
Julian Fischer	Service, Migratory Bird Management
(James) Barry	U.S. Geological Survey, Alabama Cooperative Fisheries and Wildlife Research Unit and Auburn University
Grand	Alaska SeaLife Center and University of Alaska Fairbanks
Tuula Hollmén	Service, Anchorage Fish and Wildlife Field Office, Endangered Species Branch
Ellen Lance	
Jim Lovvorn	Department of Zoology, Southern Illinois University
Brian McCaffery	Service, Yukon Delta National Wildlife Refuge
Deb Nigro	U.S. Bureau of Land Management
Margaret Petersen	U.S. Geological Survey, Alaska Science Center
Jason Schamber	ADFG, Waterfowl Program
Todd Sformo	North Slope Borough
Ted Swem	Service, Fairbanks Fish and Wildlife Field Office

Former Members

Dan Rosenberg	ADFG
Tom Rothe	ADFG
Greg Balogh	Service, Anchorage Field Office
Russ Oates	Service, Migratory Bird Management
Robert Suydam	North Slope Borough
Declan Troy	Private Consultant
Angela Matz	Service, Fairbanks Fish and Wildlife Field Office
Barb Taylor	National Marine Fisheries Service
Cal Lensink	Service
Bob Day	ABR, Inc.
Bruce Campbell	ADFG

10. Appendix 3: Definitions

Possible effects of each alternative on biophysical resources and the human environment were described in terms of their intensity, duration, scale, and the nature of potential impacts. In this assessment, these terms are defined as follows:

Intensity of the Impact resulting from the specified action

- No effect – Impacts that would not affect resources or human environment.
- Negligible – Impacts that would have no measurable effect on the biological or human environment.
- Minor – Impacts that can be reasonably expected to have detectable though limited effect on the biological or human environment.
- Moderate – Impacts that can be reasonably expected to have detectable and apparent effect on the biological or human environment.

Duration of the Impact on biophysical resources or the human environment

- Short-term – Effects that only occur during implementation of an action.
- Medium-term – Effects that occur during implementation of the action and that are expected to persist for some time into the future though not throughout the life of this Plan (not longer than 5 years).
- Long-term – Effects that occur during implementation of the action that are expected to persist throughout the life of this Plan and, most likely, longer (longer than 5 years).

Scale of the Impact in a specified area

- Site-specific – Positive or negative impacts occurring at a specific site that are relatively small in size (e.g., a nest site).
- Local – Positive or negative impacts occurring throughout a specific area that are large in size (e.g., in a lagoon, island or breeding area).

Nature of the Impact resulting from the action

- Positive – Impacts that maintain or enhance the quality and/or quantity of resources or human environment.
- Negative – Impacts that degrade the quality and/or quantity of resources or human environment.

Cumulative Effects

A "cumulative impact" is an impact on the environment which results from the incremental impact of the action when added to other past, present, and reasonably foreseeable future actions regardless of what agency (Federal or non-Federal) or person undertakes such other actions. Cumulative impacts can result from individually minor but collectively significant actions taking place over a period of time (40 CFR 1508.7). At the end of each alternative, we discuss anticipated cumulative impacts of the alternative on the biophysical and human environments.

11. Appendix 4: Example Minimization Measures from Barrow Eider Project

During nest monitoring:

Nests not monitored by camera (including those monitored using data loggers) will be visited approximately once every 7 to 10 days during incubation. The incubation period lasts ~24 days post-laying of the penultimate egg for many waterfowl species. Nests will be relocated with GPS coordinates and maps. When visiting a nest, we aim to confirm the presence of the female on the nest without flushing her. For many species we can confirm presence with binoculars from ~20 – 40 m away. If the hen is absent from the nest or flushed when approached, we visit the nest briefly to count, age, and cover the eggs. If eggs have not been previously measured (see description of methods under nest searching, above), we will quickly measure the length and width of eggs. Latex gloves will be worn when touching the nest or eggs. Nest revisits generally take only a few minutes. We avoid placing backpacks within 20m of the nest and using more than 1 person to visit the nest to limit exposure to human odors and matting vegetation that may attract predators. Information on nest contents and status will be recorded on each visit. The data will then be entered into the Eider Ecology Database in program Access.

During hen capture on nests:

Following capture, hens will be carried ~40m from the nest bowl for processing, to minimize damage to cover near the nest bowl which might influence predation risk. While the hen is banded and samples are taken, one crew member will measure eggs (see description under nest searching, above) if this has not already been done.

Methods of alleviating stress during handling and sampling waterfowl:

Our best method to alleviate any adverse effects of handling and sampling of birds (i.e., stress and pain) is to have experienced staff holding and sampling birds, and minimize handling time. Experienced bird handlers will hold the bird with firm enough pressure to eliminate movement by the bird and potential injury, but not so firm as to inhibit normal respiration. A bird that is held by a confident bird handler, will struggle less, can be sampled quicker and easier, and will be held shorter, thus enduring less stress. The capture must have enough staff to be able to process the bird quickly and efficiently, but not so many people as to disturb the area near the nest and potentially attract predators. Our ideal capture crew is 3 people. As we watch birds for signs of stress, if stress levels appear to elevate above normal, our best method to reduce stress is to keep the bird cool and eyes covered. In this situation we may add water to the webbing of the feet, and blow on the feet. This immediately creates evaporative cooling, and quickly lowers the bird's body temperature. Covering the head with a light towel or tucking the bird's head under a wing are two methods that also work well to alleviate stress, as it becomes dark, visual stimuli are reduced, and birds tend to relax. If we see a bird show signs of possible capture myopathy, we immediately cease our sampling and carefully monitor the bird. The feet are cooled, the holder's grip on the bird is relaxed to improve respiration, and the ability of the bird to keep its head elevated is monitored closely. Typically a bird will quickly begin to show more normal vital signs, and once this occurs, we will release the bird. If in the rare event the bird can't regain normal vital signs after trying several methods to relax and cool the bird, we would transport the bird to the veterinarian in Barrow for medical treatment.

12. Appendix 5: Written Comments Received on the Draft Environmental Assessment



THE STATE
of **ALASKA**
GOVERNOR BILL WALKER

Department of Fish and Game

DIVISION OF WILDLIFE CONSERVATION
Southcentral Region

333 Raspberry Road
Anchorage, Alaska 99518-1565
Main: 907.267.2257
Fax: 907.267.2532

November 16, 2015

Geoffrey Haskett, Director
Regional Director
U.S. Fish and Wildlife Service
1011 E. Tudor Rd.
Anchorage, AK 99503

Dear Mr. Haskett:

The Alaska Department of Fish and Game (Department) appreciates the opportunity to comment on the U.S. Fish and Wildlife Service (Service) draft Environmental Assessment (EA) for reintroduction of Steller's eiders to the Yukon-Kuskokwim Delta (YKD), Alaska. We have been involved in the listing and recovery of Steller's eiders since the petition to list in 1990. More recently, the Department has presented our views on the reintroduction as a member of the Steller's eider Recovery Team and throughout this NEPA process.

We have documented many concerns regarding the basis for the reintroduction and the likelihood of success¹. The Service response² clarified that the Service decided to reintroduce Steller's eiders to the YKD in spite of the many challenges and uncertainties. The response letter failed to address issues raised by the Department to our satisfaction, however; nor did it convince us that this effort is justifiable, necessary, or that it will have a reasonable chance of success.³ The EA also has not addressed these issues, nor does it provide sufficient detail to assess biological or other potential risks. A more detailed reintroduction and monitoring plan should be presented.

The Department reiterates its concern for protecting local residents from incidental take of Steller's eiders on the YKD or elsewhere in Alaska. We believe that designating any reintroduced population as

¹ Letter, April 3, 2013, Doug Vincent-Lang, Director, Division of Wildlife Conservation, to Geoff Haskett, Regional Director, USFWS.

² Letter, May 17, 2013, Mr. Tim Jennings, Assistant Regional Director, Fisheries and Ecological Services, USFWS to Doug Vincent-Lang, Director, Division of Wildlife Conservation.

³ Letter, February 3, 2014, Doug Vincent-Lang, Director, Division of Wildlife Conservation, to Geoff Haskett, Regional Director, USFWS).

a “non-essential experimental population” under sections 10(j) and 4(d) of the ESA would provide benefit in the case of unintentional or incidental taking of Steller’s eiders during the spring/summer subsistence hunt. Designation as a non-essential experimental population would also obviate the need for unnecessary regulatory reviews. The EA has discounted the possibility of a 10(j) designation based on their “goal for distribution” and “expectations for consultation.” Discounting this option is premature, however, without (a) good knowledge of historical distribution of YKD birds relative to the larger Pacific population; (b) the ability to predict future distribution of an *experimental* population; or (c) an adequate definition or determination of what would constitute “wholly separate” in the wild for these populations.

In addition, the Service is in the process of reviewing incidental take regulations under the Migratory Bird Treaty Act (MBTA, Programmatic Environmental Impact Statement, 80 Fed. Reg. 30032-30036; May 26, 2015). This process affords the Service the opportunity to bring the MBTA into conformity with the ESA regarding incidental take of a listed species by subsistence hunters. Through the Pacific Flyway Council, the Department submitted the following comments to the Service in July 2015:

The assessment of the proposed approaches should clarify incidental take authorization under both the MBTA and the ESA. The ESA, Section 10(e) provides exceptions to the provisions for the taking of endangered or threatened species by (A) any Indian, Aleut, or Eskimo who is an Alaskan Native who resides in Alaska; or (B) any non-native permanent resident of an Alaskan Native village, if such taking is primarily for subsistence purposes. For consistency with the ESA, the Service should evaluate both the feasibility and efficiency associated with a modification of the MBTA to establish regulations that allow for the taking of endangered or threatened species in consideration of impacts to cultural and traditional values. Subsistence hunting is essential to the culture, traditional values, and economy of rural Alaska and the potential to incidentally harvest listed species (e.g. Spectacled or Steller’s eiders) while hunting for other species is ever present in many parts of northern and western Alaska during spring, summer, and fall. Such regulations will improve efforts to cooperatively manage threatened and endangered species in Alaska. As with the ESA, this possible modification would not preclude the Secretary from prescribing regulations if the taking negatively affects a species.

We encourage the Service to postpone a reintroduction until this MBTA review process has been completed and codified, rather than using “expectations” to ensure that the proposed Steller’s eider introduction is a socially and culturally responsive and responsible project. This approach would avoid many of the costly issues and ill-will created in Barrow that compromised conservation efforts as a result of the Service’s response to the incidental taking of eiders.

The Department and residents of the YKD would likely be more supportive if the Service embraces this process. The Service's assessment of the risk to local hunters of accidentally shooting a Steller's eider and their predicted response is speculative and again, based on "expectations" rather than on pre-defined policy.

The EA discounts the importance of predator control to the success of the project. However, predator control, perhaps the one action most necessary for success, will increase the success of other birds nesting in the reintroduction area. This would provide a prey buffer for any introduced (or native) Steller's eiders. Predator control in the coastal zone of the YKD can also benefit emperor geese, cackling Canada geese, brant, and spectacled eiders, at minimum. The increase in cackling Canada goose populations on the YKD may be the primary mechanism responsible for the increase in spectacled eiders.

The EA neglected to include the North Slope of Alaska as an alternative reintroduction site. The captive population and the testing of experimental methods necessary for success of a reintroduction effort are better suited to supplement the North Slope population. Costs would be significantly less, and outreach and education programs are in place. This region has existing infrastructure; historical information on Steller's eider demographics and behavior; ongoing predator control; established protocols for monitoring breeding birds; and most importantly, Steller's eiders are present and nest successfully. The more northerly latitude is arguably more conducive to the success of a predominantly Arctic nesting species, based on the presence of Steller's eiders both here and, more significantly, in Russia.

Prior to any reintroduction, the Service must evaluate whether any of the existing Alaska Steller's eider populations meet the criteria for designation as a distinct population segment (DPS). If a reintroduction were successful on the YKD, delisting could not occur independently without the YKD and North Slope breeding birds being classified as DPSs. Although the Recovery Plan provides for delisting subpopulations separately, any proposal to delist them separately requires an evaluation of whether the criteria under the Service's distinct vertebrate population segment policy are met (61 Fed. Reg. 4722).

Bruce Dale
Director

cc:
Neesha Stellrecht, USFWS, Fairbanks
Patty Schwalenberg AMBCC
Myron Naneng, AVCP
Dan Rosenberg, ADF&G
Steve Machida, ADF&G



Public Employees for Environmental Responsibility

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November 16, 2015

Neesha Stellrecht
U.S. Fish and Wildlife Service
101 12th Avenue, Room 110
Fairbanks, AK 99701

Re.: **Comments on Draft Environmental Assessment for the Reintroduction of Steller's Eiders to the Yukon-Kuskokwim Delta, Alaska.**

On behalf of Public Employees for Environmental Responsibility (PEER), we are writing to provide comments on the draft Environmental Assessment for the Reintroduction of Steller's Eiders to the Yukon-Kuskokwim Delta, Alaska. We would like to draw the U.S. Fish and Wildlife Service's ("Service") attention to several concerns, including concerns related to –

- Undisclosed costs and uncertain duration;
- Insufficient consideration of climate change in site selection; and
- Failure to give due weight to risks increasing the likelihood of reintroduction failure.

I. Compliance with the National Environmental Policy Act (NEPA)

Even to a cursory reader, the subject draft Environmental Assessment (draft EA) clearly reads as if it is a justification for a decision already concluded. While the preferred alternative it may have been discussed internally within the Service, the draft EA appears crafted to convey that further debate in the public comment arena is redundant or superfluous (see Matz et al. 2008). Such an approach preempts the letter and intent of NEPA for public scoping and limits the opportunity to explore a full range of alternatives that might otherwise not occur.

This pre-decisional factor is more pertinent given the magnitude of the potential taxpayer investment and duration of the proposed reintroduction effort. The poorly crafted narrative, misrepresentation of data (including the cavalier manner in which the potential duration of the project is presented as "several years") demonstrates a flagrant disregard for agency compliance with NEPA. Additionally, there are Service activities ongoing that may be interpreted as within

the scope of the proposed reintroduction, thereby fragmenting the NEPA process rather than integrate the requirements of NEPA with other planning.¹

II. Costs

With the understanding that the Anti-Deficiency Act precludes the federal commitment of funds outside the normal budgeting process, the draft EA fails to indicate the potential maximum projected costs of the reintroduction effort of \$45 million, over the course of 30 years for a stated goal of 50 breeding hens. In a highly optimistic scenario, if reintroduction is fully successful this amounts to a minimum of \$900,000 per breeding hen. However, a more realistic and probable scenario is far less than 50 breeding hens, which would increase the cost per hen to an even steeper sum.

III. Reintroduction Timeline

The draft EA describes the reintroduction as occurring over “several years.” However, the proposed reintroduction may well span approximately 30 years. This simple discrepancy undermines the credibility of the agency presentation for the proposed reintroduction. Further, it raises the question of what other facts may have been conveniently distorted or overlooked. Given the rate of climate change in the Arctic and subarctic regions, trivialization of such developments minimizes the expected effects of sea level rise, saltwater intrusions, shoreline erosion, permafrost thawing and vegetation shifts. None of these factors are adequately addressed in the draft EA.

IV. Consideration of Reintroduction Logistics

While it is understandable that some site-specific data is sensitive and cannot be disclosed, there should be more detail in the draft EA regarding brood stock, such as

- What surrogate species, source of brood stock replacements and turnover rates for the duration of the project;
- What are the plans for disposal of non-productive hens or unviable eggs;
- How predator control will be dealt with;
- What measures will be used to mitigate effects of climate change;
- What threshold or parameters will be used to determine whether the reintroduction is to be deemed infeasible?

These are among many other details inferred or missing. Until they are filled in, the

Unknowns abound in the draft EA, not only from the lack of details, but from the failure to acknowledge them at all. For example, there is little discussion regarding the cause for the original breeding population to decline or abandon this site. Are those factors still present and if so, how will these affect the successful outcome of the reintroduction effort over the duration of the effort?

Other examples of unaddressed but highly relevant factors in the draft EA include –

- What is the contribution of this subpopulation to the overall population, historically or projected?
- With a cadre of investigators in the field to monitor reintroduction efforts, will this attract predators or create trails leading to surrogate nesting sites?
- As the primary reintroduction site in the Yukon-Kuskokwim Delta, 60°N latitude, is the general demarcation between continuous and discontinuous permafrost, how will the loss of permafrost affect surface vegetation and saltwater intrusion over the duration of the effort.

While the draft EA does discuss climate change, it only does so in terms of climate change's unpredictability. In response to the threat of climate change at the reintroduction site, the Service states that it will simply use "adaptive management strategies to respond to possible environmental changes caused by climate change." No further details are provided.

The draft EA indicates that the Service has failed to adequately factor in climate change. This is problematic because climate change could significantly alter the suitability of the site selected and therefore render the reintroduction futile and a waste of enormous sums of federal funds.

At the end of the day, enormous sums would be spent with equally great risks – not only for the Steller’s Eider, but also the Service’s credibility with the taxpaying public. Even if the effort is successful, neither the draft EA nor any technical document associated with the recovery plan estimates the total contribution of the reintroduced population to overall species recovery.

It should also be noted that village elders oppose the reintroduction effort because they do not want the increased presence of law enforcement in their community that this reintroduction would bring. However, others support the reintroduction because of the revenue that the effort would bring to the local economy.

VI. Conclusion

PEER appreciates the opportunity to comment on the draft EA for the Reintroduction of Steller’s Eiders to the Yukon-Kuskokwim Delta, Alaska, as well as the Service’s consideration of the issues raised.

Sincerely,

Jeff Ruch
Executive Director



November 16, 2015

Neesha Stellrecht
Eider Recovery Coordinator
U.S. Fish and Wildlife Service
101 12th Avenue, Room 110
Fairbanks, AK 99701
Neesha_Stellrecht@fws.gov
Phone: (907) 456-0297
Fax: (907) 456-0208

Re: Reintroduction of Steller's Eiders to the Yukon-Kuskokwim Delta in Alaska:

The Center for Biological Diversity supports the proposal by the U.S. Fish and Wildlife Service (Service) of reintroducing captive-raised Steller's eiders (*Polysticta stelleri*) on the Yukon-Kuskokwim Delta (Y-K Delta) in southwestern Alaska. Our organization's members and supporters have a longstanding interest in the conservation of wildlife in Alaska and support the reintroduction of the Steller's eider in this region to bolster the recovery of the species. A reintroduction program will help the threatened Alaska-breeding population of the species recover. A viable western Alaska subpopulation is an essential recovery criterion that must be fulfilled for the species to be delisted under the Endangered Species Act.

Steller's eider was considered a common nesting bird species on the Y-K Delta but currently they nest exclusively on the north coast of Alaska and Northeast Russia. One of the main factors this species received threatened status in 1997 under the Endangered Species Act (USFWS 1997) was their drastic decline and near disappearance of breeding populations from the Y-K Delta. Non-breeding populations occur in coastal waters of Peard Bay, Bristol Bay, Kodiak, the western Kenai Peninsula, and the eastern Aleutian Islands. The reintroduction of breeding populations in the Y-K Delta and potential recovery would bolster the Alaska-breeding population which is necessary for the final recovery of the species. Recent studies have shown that in late summer early fall (August to October) over 50% (7 out of 13) of Steller's Eiders tagged with satellite transmitters from Barrow nesting grounds (North Slope of Alaska) used the Kuskokwim Shoals in the Y-K Delta during the wing molt (Martin et al. 2015). This study corroborates the importance of this area as essential habitat for the species. Moreover, the successful reestablishment of Steller's eiders in the Y-K Delta will contribute to the ecological diversity of the region.

The Service forecasts that the "*Steller's eiders nesting on the Y-K Delta would migrate to and share the same non-breeding areas currently used by the species nesting on the North Slope and in Arctic Russia.*" A satellite tagging study support this prediction showing that species using the Y-K Delta can and do migrate during the winter to the eastern Alaska Peninsula (**Fig. 1**, Martin et al., 2015). The Alaska Peninsula is a common non-breeding area used by the species that nest on the current breeding grounds in the North Slope and in Arctic Russia.

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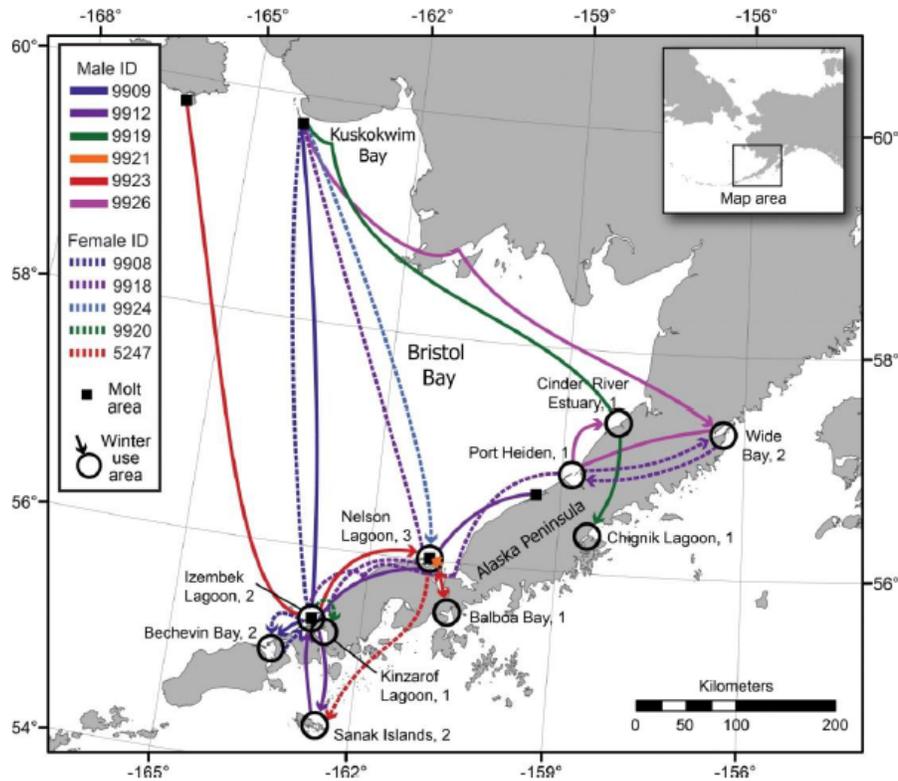


Fig. 1 Fall movements from molting areas to winter use areas by 6 male and 5 female Steller's Eiders fitted with satellite transmitters near Barrow, Alaska, in June 2000 and 2001. Numerals indicate the number of individual birds that occupied the winter use area. Colored lines follow idealized routes for each individual to illustrate connectivity between molting and winter areas. Arrowheads denote arrival at primary and secondary winter use areas. *Figure and Legend as in Figure 2 from Martin et al. (2015).*

We support the monitoring efforts the Service plans to evaluate the recovery of the species during the reintroducing program. As the Service explained, reintroduction efforts would take several years to implement as new ducklings hatched and are raised in captivity facilities. During this time, the Service plans to use adaptive management considering new scientific information, captive propagation, habitat and release site selection assessments, release of birds and eggs in selected habitats, site selection reassessment, and monitoring to evaluate program progress. This approach allows reducing uncertainty during the reintroduction process, monitoring ecological impacts after reintroduction, and continuing evaluation of the program to inform future decisions.

Among the most important steps in the reintroduction process is the successful release and reestablishment of Steller's eiders to the wild after rearing in captivity. The Service, as explained

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in the Environmental Assessment, should prioritize new studies that focus on understanding important species' life history characteristics that are unknown or less understood and that are essential for the permanent establishment of the species in the area. For example, the Service recognizes that the role of parental guidance in developing successful foraging, predator avoidance, and migratory behavior is largely unknown for the species. Similarly, the mechanisms associated with natal philopatry are unknown. This is particularly important to understand if breeding populations are expected to return to the Y-K Delta after winter migration.

The reintroduction of Steller's eider in the Y-K Delta must be monitored and re-evaluated through the entire process to determine its successfulness. As the Service explained, for the program to be entirely successful "*released birds must move to the appropriate molting, staging, and wintering areas, survived adulthood, return to the Y-K Delta and successfully reproduce*". The Services and collaborating agencies must monitor released individuals during the entire life history cycle to determine if population parameters such as mortality compromise reintroduction efforts. As such we agree with the proposed five keys monitoring targets to determine survival rate after release, during fledging, wintering, return, and reproduction. In particular, we agree with most of proposed release methods although "*releasing small ducklings without prolonged captivity on the Y-K Delta*" seems particularly questionable as small ducklings may depend on parental care for survivorship as seen in other similar species (Gendron and Clark 2000, Kilpi et al. 2001).

We recommend that guidelines and a plan be used to reduce the risk of disease for the new facility that will be constructed in the YK Delta. Current guidelines for animal reintroduction and disease prevention plan, already in place in the SeaLife Center facility, will be important to prevent any disease from spreading.

Increasing genetic diversity would increase the rate of reintroduction success. Because the species has very few original breeding individuals in the YK Delta, captive birds for reintroduction were originated from Barrow, Alaska. We support the Service decision for future augmentation of the captive flock from males captured on wintering grounds. This approach may increase genetic diversity of new ducklings and can increase the probability of survival during reintroduction.

We strongly agree with the Service that to really succeed reintroducing Steller's eider on the Y-K Delta community involvement is fundamental. Involving and engaging the local communities in conservation efforts is in fact essential for the recovery of the species in regions of Alaska. This is an ideal opportunity for the community to be involved in a project that not only will see results in the near future but also will benefit from the conservation efforts. Through outreach, the reintroduction program will gain support from the local community and engage them in conservation efforts. This disseminates environmental awareness of the issue, may promote local employment, and ensures continuing protection and advocacy by the local community. This will be important as the program evolves and concrete results (i.e., Steller's eider population increase in the region) will be observed in the coming years if reintroduction is successful. The



reintroduction program will take years of executing, monitoring, and maintenance and local community involvement and environmental awareness of the project is crucial for the success of the entire endeavor.

The original causes of Steller's eider decline in the Y-K Delta are unknown. We agree with the Service that it is impossible to be certain that constraints to population re-establishment have disappeared or lessened. However, the Service must take steps during the reintroduction program to better understand those factors that may affect reintroduced populations in the region. Studies should be carried out to determine how changes in the community structure in the released habitat may affect the reintroduction of the species. For example, would foxes disproportionately prey on Steller's eider eggs and ducklings during reintroduction? Would ingestion of spent lead shot be a problem that may poison birds? Would changes in the marine environment such as habitat characteristics (sea grass production), water temperature, or food supply affect the survival of new juveniles in the region? What is the degree of natal philopatry for new reintroduced individuals? How would climate change (e.g., storm surges, permafrost melting, and vegetation changes) and ocean acidification affect survival success during and after reintroduction? These are a few questions that will be ideal to address during the reintroduction program. In fact, this program is an excellent opportunity to study assisted population recovery of a species with a migratory life history cycle and that inhabits a region that is highly vulnerable to the effects of climate change.

In summary, the Center for Biological Diversity supports the reintroduction of Steller's eider in the Y-K Delta. We look forward to the success of this reintroduction and the recovery of the species in Alaska. Thank you for your consideration of these comments.

Sincerely,

Dr. Abel Valdivia,
Marine Scientist
Center for Biological Diversity
1212 Broadway, Oakland, CA 94612
Office: 510-844-7103

13. Appendix 6: Response to the Comments Received on the Draft EA

Background: In October, 2015, the Service released the Draft EA pursuant to the NEPA, on the potential reintroduction of Steller's eiders to the YKD. Alaska-breeding Steller's eiders are listed as threatened under the ESA, and the species is closed to harvest under the MBTA). The Eider Recovery Team recommended the Service investigate the potential of reintroducing Steller's eiders to the YKD as the only feasible method identified to establish a viable western Alaska subpopulation.

The public comment period for the draft EA closed on November 16, 2015. Oral comments were received at the AMBCC and the Association of Village Council Presidents – Waterfowl Conservation Committee meetings, in conjunction with Service presentations on the project. Written comments were received from Public Employees for Environmental Responsibility (PEER), the ADFG, and the Center for Biological Diversity.

After reviewing all comments we grouped them into general categories to avoid duplication in our responses. The original comment documents are attached. Summarized comments (in bold font) followed by our responses are provided below.

Comments received were categorized into the following groupings: 1) The draft EA does not fulfill NEPA requirements; 2(a) The draft EA does not adequately protect subsistence hunters from prosecution; 2(b) suggestions for regulatory remedy); 3) Concerns about the lack of climate change analysis or mitigation strategy; 4) Insufficient answers to basic biological questions; 5) More detail is needed on costs, methods, uncertainties, and likelihood of success, especially regarding predator control; and 6) Miscellaneous comments.

1. THE DRAFT EA DOES NOT FULFILL NEPA REQUIREMENTS.

According to PEER, the Draft EA reads as if it is pre-decisional, meaning, the Service has already justified its decision to proceed with reintroduction and that the NEPA process is “superfluous.” Additionally, PEER commented that the Service misrepresented data, such as describing a non-specific project time frame of “several years.” PEER also stated that the Service has already engaged in some reintroduction actions, and references 40 CFR 1500.2 which states “Federal agencies shall to the fullest extent possible: (c) Integrate the requirements of NEPA with other planning and environmental review procedures required by law or by agency practice so that all such procedures run concurrently rather than consecutively.”

The ADFG stated the draft EA fails to address financial, social, and biological unknowns contributing to high uncertainty of success, and that clear reintroduction, monitoring, and delisting plans were lacking, there is no outline for periodic review, evaluation of biological and social impacts associated with an experimental release, or responses to adaptive management techniques.

The NEPA requires federal agencies integrate environmental values into their decision-making processes by considering the environmental impacts of their proposed actions and reasonable alternatives to those actions. Often, Federal agencies conduct pilot studies or surveys to gather

information necessary to inform a decision. For example, environmental surveys on proposed highway routes help inform the environmental review process. Similarly, the Service conducted studies not involving the release of Steller's eiders (such as habitat assessment, and the development of husbandry techniques) to assess whether reintroduction may be feasible. Thus, while we present information from field and other studies that supports reintroduction, such information is necessary to make an informed decision between the "preferred" and "no action" alternatives.

Some project aspects are unknown at this time, and will depend on the availability of funds, biological considerations, and many other factors. In addition, because this project is complex and methods may be refined, an adaptive management strategy would be used. This strategy will allow integration of population models, decision models, and iterative learning steps into a long-term management and monitoring framework for Steller's eider reintroduction. An adaptive management strategy is a way of dealing with uncertainties and allows changes over time to improve the project and address concerns or uncertainties. If significant changes in the scope of the project (e.g., location, methods etc.) are proposed during use of the adaptive management framework, the FWS will ensure that all regulatory requirements such as NEPA, ESA, MBTA, and State of Alaska permits are implemented so we continue to meet obligations under 40 CFR 1500.2.

2. THE DRAFT EA DOES NOT ADEQUATELY ADDRESS PROTECTION OF LOCAL SUBSISTENCE COMMUNITIES FROM PROSECUTION UNDER ESA AND MBTA SHOULD THEY INADVERTENTLY SHOOT A REINTRODUCED STELLER'S EIDER WHICH IS A CLOSED SPECIES UNDER THE ESA AND MBTA.

The consequences of inadvertent shooting of a Steller's eiders (a closed species) and increased presence of law enforcement officers have been raised as concerns. However, support for the program was expressed by local residents, including village elders, during all the many visits to local communities on the YKD conducted by the Service regarding this project. Local support for the project was also demonstrated by the invaluable amount of logistical support we received from the village of Chevak in 2015 while conducting studies to provide additional background information to the project. We have committed to an open and ongoing dialog with the affected villages and we will also provide presentations and updates on these meetings to the Councils, at AMBCC meetings, and other appropriate venues.

In our considerations of potential reintroduction of Stellers' eiders to the YKD, one of three principle objectives is minimizing impacts to the subsistence way of life. To achieve this objective, we have conducted government-to-government consultations with officially recognized tribal governments and have met repeatedly with Village Councils from the potentially affected villages and broader representational bodies including the Association of Village Council Presidents and Alaska Migratory Bird Co-Management Council. In those meetings, we openly discussed the challenges associated with the presence of an MBTA "closed species" where subsistence practices take place. We have heard and understand the concerns of local communities and their Regional representatives, and recognize the need to continue to work with affected communities to minimize any impacts to subsistence hunters and reduce risk of inadvertent harvest of Steller's eiders. We intend to continue discussions and develop strategies

in collaboration and cooperation with the local communities. We also believe this need will continue for as long as the project persists and minimizing impacts to subsistence users will be a key component of the adaptive management plan.

As discussed in the draft EA, Steller's eiders are afforded protections under both the ESA and MBTA. While the ultimate goal of this project and other recovery actions is to recover the species, reintroduction in the short term will not result in a change in the protections afforded to the species under either of these regulations. Given the low numbers of Steller's eiders in Alaska, we believe it is important to continue to refrain from harvesting this species. Our intent is to continue to work with subsistence hunters to encourage voluntary compliance through partnerships with local communities and Tribal governments. This type of collaborative effort has been demonstrated to be highly effective on the YKD in the past. Through outreach and education, communities realized that the use of lead shot negatively affected birds and people, and decided to petition the ADFG to ban its use. Through shooting clinics and education programs, non-toxic shot has now largely replaced lead on the YKD.

In certain cases, if voluntary compliance is not successful, we will consider the use of law enforcement, as we do for other closed species. However, we hope that by working together with communities and developing and implementing an effective outreach program law enforcement activity will not be necessary and that if it does occur, it will be done in a manner which does not offend or impact subsistence hunters.

3. REGULATORY REMEDY; SPECIAL RULES: 10(J) AND 4(d).

To alleviate concern for potential prosecution of subsistence hunters who may inadvertently shoot an ESA-listed and MBTA-closed species in an area where it did not previously occur, commenters suggested the Service should (a) designate the reintroduced population as “non-essential experimental” according to Section 10(j) of the ESA; and (b) the Service should promulgate a special rule under section 4(d) of the ESA that would allow for the unintentional or incidental taking of Steller's eiders during the spring/summer subsistence hunt; or, (c) the Service must evaluate existing Alaska's Steller's eiders pops for designation as Distinct Population Segments (DPS). The ADFG also proposed the (d) Service postpone reintroduction until a potential review of incidental take regulations (80 Federal Register 30032-30036) under the MBTA is completed and codified, and that the Service's review of the regulations provides an opportunity for “modification of the MBTA” and to “bring the MBTA into conformity with the ESA regarding incidental take of the listed species by subsistence hunters.”

(a) Develop a 10(j) Designation

Section 10(j) of the ESA provides for the designation of specific reintroduced populations of listed species as “experimental populations.” On the basis of the best available information, the Service determines whether an experimental population is “essential” or “nonessential” to the continued existence of the species. A “nonessential” designation for a 10(j) experimental population means that, on the basis of the best available information, the experimental population is not essential for the continued existence of the species. Regulatory restrictions are considerably reduced under a Nonessential Experimental Population (NEP) designation.

However, in this instance as discussed in the draft EA a 10(j) designation would not result in significant benefits to eiders or stakeholders, and is likely not legally viable for the following reasons:

1) Designating the population as an NEP requires that the population is wholly separate from the wild population. We expect reintroduced birds to use molting and wintering sites currently used by the wild population. In addition, a small number of Steller's eiders still occasionally nest on the YKD. Therefore, the reintroduced population cannot meet the standard of being "wholly separate", and will overlap in distribution with the extant wild population during several parts of their annual life cycle.

2) For the purposes of section 7 of the ESA, NEPs receive the same protections under the ESA as threatened species when the NEP is located within a National Wildlife Refuge or National Park (NP). Therefore, on National Wildlife Refuge lands, consultation requirements under section 7(a)2 of the ESA would apply. On the YKD, the population will almost certainly be released on National Wildlife Refuge lands; thus, section 7 consultation requirements would not be changed by an NEP designation (i.e., reintroduced Steller's eiders would still be considered threatened for the purposes of section 7 consultation). If the reintroduction is successful, we expect that reintroduced birds will use the same areas that Steller's eiders currently use for molting, wintering and staging. Federal agencies are currently required to complete section 7 consultation on actions they permit, fund, or carry out that may affect Steller's eiders in these areas; thus, section 7 consultation requirements will not increase due to reintroduction.

(b) Promulgate a 4(d) Rule

Under section 4(d) of the ESA, the Service has discretion in developing management programs and special regulations for threatened species. Section 4(d) allows adoption of whatever regulations are necessary to provide for the conservation of a threatened species. A 4(d) rule contains the prohibitions and exemptions necessary and appropriate to conserve that species.

An option to develop a 4(d) rule under the ESA which would allow for the inadvertent take of Steller's eiders during subsistence hunters was suggested. This option would not, however, alleviate the prohibitions of the MBTA as we explain below:

The subsistence harvest of Steller's eiders by Alaska Natives or any non-native permanent resident of an Alaska Native village is not prohibited under the ESA (see Section 10(e)). However, since 1991 the take of Steller's eiders has been prohibited under the MBTA. This status would not be changed by the publication of a 4(d) rule promulgated under the ESA.

(c) Evaluate Distinct Population Segments for Steller's eiders

The recovery plan and associated recovery criteria provide thresholds for delisting the Alaska-breeding population as a whole, and under certain specified conditions, one or both of the western and northern subpopulations separately. The plan states that a proposal to delist one subpopulation separately would require an evaluation of whether the subpopulation qualifies as a DPS using criteria described in the Service's distinct vertebrate population segment policy (detailed in the Federal Register 61:4722-4725). A comment on the draft EA states: "If a reintroduction were successful on the YKD, delisting could not occur independently without the

YKD and North Slope breeding birds being classified as DPSs.” However, based on the DPS policy, delisting one subpopulation independently could not occur without classifying the subpopulation as a DPS regardless of whether reintroduction occurs, successfully or not. Neither the DPS policy nor the Steller’s Eider Recovery Plan require or suggest that this analysis is undertaken prior to conducting management or other recovery actions.

Additionally, the conservation status of the Steller’s eider would be improved by successful reintroduction of the species to the YKD, whether evaluated at the species scale, the scale of the threatened Alaska-breeding population, or the scale of the western Alaska subpopulation. We can identify no circumstances under which conservation measures in any area, should they prove to be effective, would negatively affect the conservation, recovery, or prognosis for delisting at any scale.

(d) Postpone until review of the Proposed Incidental Take Regulations under the MBTA

In May, 2015, the Service proposed to evaluate the environmental impacts of a proposal to authorize incidental take of migratory birds under the MBTA. As of January 2016, the schedule for proposing and finalizing these regulations has not been determined, nor has the scope of the regulatory changes or what forms of incidental take may be authorized. According to the proposal, regulatory changes will focus on “particular industry sectors,” are intended to “reduce existing human-caused mortality of birds” and may create a “mechanism to obtain meaningful compensatory mitigation for bird mortality that cannot be avoided or minimized through best practices or technologies.” The objectives are to identify and implement measures to reduce and compensate for incidental take while also authorizing it, and will not merely provide a means to allow incidental take. It is not clear that proposed regulations will alleviate the concerns related to the potential take of a Steller’s eider, nor is it clear that mechanisms and solutions proposed for national-level causes of bird mortality will provide the best approach for concerns that have been raised about the proposed reintroduction project. Therefore, we believe that local, rather than national approaches will be better suited, and we are committed to working with the local communities so that incidental take is avoided. We will continue to monitor the development and publication of the rule. If it can be applied to reintroduction in any way we will work with stakeholders to consider and implement it as appropriate.

4. CONCERNS ABOUT CLIMATE CHANGE IMPACTS AND LACK OF CLIMATE CHANGE ANALYSIS.

Commenters stated there was insufficient consideration of climate change in site selection, or climate change mitigation over the potential decades of the project, and that sea level rise, saltwater intrusions, shoreline erosion, permafrost thawing and vegetation shifts, and other potential climate change effects were not adequately addressed.

Habitat suitability has been considered with input from eider biologists, YKD habitat experts, and climate change experts. During the planning process, an expert workshop was held in 2010 to review candidate sites for reintroduction, identify research needs, and develop site selection criteria based on habitat quality considering climate change uncertainties. While uncertainty surrounds future habitat suitability due to potential climate change-related habitat change, general predicted responses of YKD habitats to climate change include minor shifts on the active

tidal flats and major shifts on inactive tidal flats and abandoned flood plains. It is recognized that the rates and effects of climate change, and abilities of Steller's eiders to resist or adapt to these changes are unknown, and research priorities have been identified to understand and monitor environmental change and effects on eiders in conjunction with future reintroduction efforts.

Research staff at the SeaLife Center used a spatial mapping approach to develop a habitat suitability simulation model to evaluate current and future habitat suitability for reintroduced Steller's eiders on the YKD. A gridded spatial map of the YKD incorporates information from published research and expert opinion for important habitat characteristics including flooding probability, salinity range, pond availability, and ecotype designation. The model has been presented to a variety of stakeholders and experts for input on various layers and methodology, and can be updated as new information about habitat layers becomes available.

Research on eider-habitat associations and responses of eiders to potential change in environmental conditions has focused on two key habitat factors: wetland salinity and food availability. The SeaLife Center staff are conducting controlled laboratory studies to characterize tolerance thresholds and effects of salinity on Steller's eider ducklings. This information will be used in site selection and release method planning efforts. We are also assessing food availability and potential changes of available foods in relation to environmental change, developing more precise techniques to track female and duckling diets, and characterizing energetic strategies and consequences of potential changes in food resources on eiders.

Site selection has been considered at two time scales - short term for a method testing phase of the reintroduction program, and long term for implementation of any future release program. Climate change impacts on habitats will be considered throughout the site selection process. A structured decision making process was developed to determine optimal release sites on the central coast of the YKD. Expert input was used to identify and rank suitable areas within the historical range of the species on the YKD and the spatial habitat simulation model was used to assess suitability of top candidate sites by overlaying available ecological information, such as pond availability and ecotype. More detailed site-specific assessments of candidate locations have involved baseline information on habitat characteristics, with potential direct and indirect impacts of climate change as a key consideration. Wetland habitat characterization is based on field measurements and remote sensing data, following established protocols for habitat type assessments and monitoring of long-term change on the YKD. Data collected at candidate sites include vegetation records and measurements of pond salinity, pH, temperature, and food availability (biomass, composition, climate change vulnerability). We will also establish a long term environmental monitoring site at the release location to track habitat characteristics and changes at the selected sites.

5. UNANSWERED BIOLOGICAL QUESTIONS.

(a) Are the original causes of species decline still present? Could they affect the reintroduction effort? (b) What is the contribution of the western subpopulation to the

overall population and species recovery? (c) Could field crews and the project have significant impacts?

(a) Are the original causes of species decline still present? Could they affect the reintroduction effort?

Kertell (1991), Flint and Herzog (1999), Quakenbush et al. (2002), and the U.S. Fish and Wildlife Service (2002) have suggested factors that may have contributed to the disappearance of nesting Steller's eiders on the YKD. These include loss of historical nesting habitat, hunting, lower nest success because of increased predation on eggs and ducklings, changes in structure of the ecological community, low survival rates due to lack of available food or lead poisoning, and changes in the marine environment that affected productivity or survival.

It is likely that multiple factors contributed to the observed decline. Because surveys and extensive data collection were not conducted during the decades in which the apparent decline took place it's difficult to pinpoint the causes of the decline. However, potential obstacles to the success of reintroduction will be addressed when possible through management actions. Additionally hypotheses may be tested through experimentation during the pilot phase of our reintroduction program.

(b) What is the contribution of the western subpopulation to the overall population and species recovery?

In the recovery plan for Alaska-breeding Steller's eiders, the Alaska-breeding population will be considered for delisting from threatened status when the Alaska-breeding population has $\leq 1\%$ probability of extinction in the next 100 years; AND, subpopulations in each of the northern and western subpopulations have $\leq 10\%$ probability of extinction in 100 years and are stable or increasing. As a result, in terms of the current recovery criteria, a western subpopulation that is stable or increasing in size with $\leq 10\%$ probability of extinction in the next 100 years, is required to achieve recovery and delisting.

(c) Could field crews have significant impacts?

Potential impacts associated with field crews were identified in the draft EA. Because the intent is to minimize such impacts on the biological and social environment, we plan to use protocols developed during our 20+ years of research experience on Steller's and spectacled eiders at Barrow (see Appendix 4) amended for the YKD environment. Because the best minimization measures for the YKD would likely differ in some ways from those used in Barrow, we would monitor the effectiveness of our methods and adapt them to the YKD environment as we gain experience. The project would require additional permits and reviews and hence, any impacts will undergo frequent regulatory review by experts. In addition, as described above, we would consult with local communities to ensure the project minimally impacts and hopefully benefits local communities.

6. MORE DETAILS NEEDED REGARDING COSTS, METHODS, UNCERTAINTIES, AND LIKELIHOOD OF SUCCESS; SPECIFICALLY ON PREDATOR CONTROL.

(a) Commenters stated that the Draft EA failed to adequately describe total costs. One commenter calculated \$45 million as the potential maximum cost over the course of 30 years for a stated goal of 50 breeding hens (\$900,000 per breeding hen).

(b) What threshold or parameters are used to determine reintroduction feasibility.

(c) Predator control

(a) Fiscal Concerns

A high priority for the Service, reflected as an objective of the reintroduction program, is to minimize cost. We are working with the SeaLife Center and other partners to ensure we meet this objective. Commenters calculated total costs with publicly available, but dated information that doesn't acknowledge current planning, anticipated annual cost reductions, and alternate funding sources. Further, the Service has not made a decision to commit to a long-term reintroduction program. The project is in the pilot/feasibility phase which includes continual planning, testing of release methods, and continuing evaluation of the feasibility of a long term program including the biological, sociological, and economical feasibility. The Service is using an adaptive management strategy developed with interim success indicators and critical decision points which will inform future decisions as described in the draft EA.

Annual costs of approximately \$600,000 to date were for development of the unique captive reservoir flocks of Alaska-origin Steller's eiders and spectacled eiders at the SeaLife Center; development and implementation of disease management and biosecurity protocols; and, continuing research and development of propagation and release techniques to develop capacity to implement re-introduction, if necessary. Given that many of the outlined tasks regarding research and development of techniques have been completed or are due to be completed by 2017, the annual program costs for maintenance of the captive flock will decrease. The estimated cost for the experimental releases in 2016 is \$200—300K.

(b) Threshold for reintroduction feasibility

The SERT was asked to evaluate the probability that reintroduction would result in a viable sub-population on the YKD. As "viable" is difficult to define, the Team used an interim success indicator of 50 breeding hens in 30 years on the YKD, a number that would be relatively robust to stochastic events. This measure does not necessarily relate to recovery of the YKD sub-population and does not suggest a decision was made to move forward with a long term program, but rather served an interim success indicator for the SERT to use to assist with making a recommendation to the Service.

Uncertainty exists regarding the cause(s) of decline of the former sub-population, the current threats to recovery, population biology of Steller's eiders, future habitat changes, and efficacy of alternative release methods to achieve the objective of recovery on the YKD. Reintroduction by definition is conducted in an area where the species no longer exists, and the need for management and decision making in the face of these types of uncertainties is not unique to the management of Steller's eiders. However, we are explicitly addressing these uncertainties by developing an adaptive management strategy that integrates population and decision modeling to reduce uncertainty and make informed recurrent decisions on release methods, numbers of eiders

to release, and release locations. Over the next several years, there will be a number of decision points at which time the reintroduction effort is reconsidered given new information.

(c) Predator Control

As discussed in the draft EA, we will consider a range of predator management options at release sites to improve survival and success rates. These may include exclosures and deterrents (to prevent depredation by avian predators), and the short-term lethal take of mammalian predators (foxes) in the area immediately adjacent to release sites. To increase nest success and duckling survival, foxes may be lethal taken (by shooting and or/ trapping) immediately prior to and during the nesting and early brood rearing period. In addition to the temporal limits, take would be limited geographically to the area immediately adjacent to the release site. For example, as part of the 2016 pilot study foxes may be removed from Kigigak Island, an area of approximately 8,031 acres where Steller's eiders may be reintroduced. Based on previous fox control work on the island, we estimate that <20 animals may be lethally taken as a result of this activity. Given this relatively low number of animals, the limited spatial extent (8,031 acres of the approximately 19.2million acre YDNWR), and the short duration of the effort (limited to a few weeks), significant adverse effects to the environment or fox population of the YKD are not likely. In addition, all regulatory requirements will be met before implementing this management action.

7. MISCELLANEOUS COMMENTS.

Commenters state the EA should provide more detail on (a) surrogate species, (b) source of brood stock replacements, (c) turnover rates, and (d) plans for disposal of non-productive hens or unviable eggs.

(a) Surrogate species

The surrogate species identified for use during 2016 experimental releases are common eider (*Somateria mollissima*), northern pintail (*Anas acuta*) and greater scaup (*Aythya marila*). Factors considered when choosing surrogate species included nesting abundance and density, tolerance for nest manipulation, incubation behavior, brood rearing strategy and duration, clutch size, non-breeding distribution, and the number of Steller's eider eggs that could reasonably be placed in each surrogate nest. No single species was found to be a perfect match to Steller's eider breeding behavior or non-breeding distribution so three species that proved to be a reasonable compromise were chosen by a group of YKD waterfowl experts.

(b) Source of brood stock replacements

The primary method employed in captive population management incorporates brood stock replacement needs in the annual breeding plan linked to genetic management to maintain heterogeneity compatible with the wild source population. As a secondary method, supplementation of the captive founder flock and source population with wild eggs may be used if the need arises to complement genetic diversity of the captive source population at some stage of the program.

(c) Turnover rate

The captive source population has exhibited high adult survival with low turnover rate. These parameters are considered in annual breeding and source population management plans.

(d) Plans for disposal of non-productive hens or unviable eggs

Non-productive hens, if encountered, may be used as surrogates in brood rearing (a method that has worked well in captivity) or placed in satellite facilities if space needs arise. Unviable eggs will be disposed using standard, approved protocols for biological material.

7. FAILURE TO CONSIDER THE USE OF IZEMBECK NATIONAL WILDLIFE REFUGE AS A RELEASE SITE

The EA recognizes Izembek National Wildlife Refuge as a potential reintroduction site but provides no parameters for using this site concurrently or in lieu of the primary site at Yukon-Kuskokwim Delta.

Izembek National Wildlife Refuge has been identified as a potential site for releases of ducklings raised on the YKD described as the “assisted migration” release method. While Izembek NWR may be part of the reintroduction program in the future, at this time we do not consider it as a primary site for the reintroduction program. In all release methods described, eggs would be hatched and ducklings raised on the YKD; the site where we intend to reestablish a viable subpopulation.

8. FAILURE TO INCLUDE THE NORTH SLOPE AS AN ALTERNATIVE REINTRODUCTION SITE

The EA neglected to include the North Slope as an alternative reintroduction site.

The Service (in the Steller’s Eider Recovery Plan) and the Eider Recovery Team recommended investigating reintroduction and/or augmentation as a recovery tool for Steller’s eiders, a task which the Reintroduction Sub-committee and other experts took on at an structured decision making workshop in January 2008. Initially, discussions regarding the reintroduction and augmentation of Steller’s eiders included the objectives of augmenting the North Slope population and reintroducing birds to the YKD. During the workshop, sub-committee members ran population models using the best vital rates available at the time that suggested significant population increase could not be achieved using augmentation of the North Slope population, as it would have to occur at levels that were not logistically possible or cost-effective. Other recovery actions, such as fox control and outreach, were more likely to be effective at recovering the existing North Slope breeding population and these efforts are underway. The sub-committee members recommended that augmentation efforts on the North Slope should only take place if they facilitate learning for the reintroduction on the YKD. Upon further discussion, the group felt that differences between the two areas, including habitat, predator populations, nesting density of other waterfowl, infrastructure, and threat attenuation, may make them too different to apply learning from one area to the other. Therefore, given that population augmentation is unlikely to be successful at significantly increasing the population on the North Slope, and that given the differences between the North Slope and YKD are likely to preclude

learning that may advance reintroduction on the YKD, the subcommittee recommended that reintroduction only be considered on the YKD.

This conclusion was presented to the Recovery Team in February 2009 and no objections were stated at that time. The notes from the workshop were ratified, illustrating that the Eider Recovery Team concurred with the Sub-committee's recommendation.

9. REINTRODUCTION WILL INCREASE REGULATORY BURDENS

Reintroducing a listed species will increase ESA regulations; specifically, Section 7 consultation requirements.

The historical range of Steller's eiders on the YKD (where releases will take place) overlaps with the range of spectacled eiders and designated Steller's and spectacled eider critical habitat. Currently, any action with a federal nexus in this area must undergo section 7 consultation; reintroduction will not increase the number of consultations required.

If the reintroduction is successful, we expect that reintroduced birds will use the same areas that both Russia- and Alaska-breeding Steller's eiders currently use for molting, wintering and staging. Similar to the YKD, projects with a federal nexus within the range of Steller's eiders in Alaska must undergo section 7 consultation; thus, consultation requirements will not increase due to reintroduction.

10. REINTRODUCTION IS FINANCIALLY COSTLY

Reintroduction is financially costly. The Service and conservation organizations should spend their money on other priorities (e.g., harvest and population surveys).

The Service understands that reintroduction is an expensive undertaking. However, recovering species so they no longer need protection under the ESA is a priority for the agency. While harvest and population surveys provide important data, they do not by themselves increase populations or provide on-the-ground activities that increase populations. The Service intends to implement adaptive monitoring and management throughout the reintroduction process so that we can continually improve and modify the approach to increase the probability of success. We hope to work on different aspects of the project with many partners and organizations to incur the benefits of working with a wide group of stakeholders with different viewpoints, resources, and expertise.

11. CONCERNS ABOUT THE STATUS OF ALASKA-BREEDING STELLER'S EIDERS UNDER THE ENDANGERED SPECIES ACT

The Alaska-breeding population should not be listed as Threatened. The size of the Pacific population remains substantial, and the Alaska-breeding population is part of the larger Pacific population (not geographically structured).

To qualify as a listable vertebrate population, the population must be both discrete in relation to the remainder of the species, and significant to the species. A population segment of a vertebrate species may be considered discrete if it satisfies either one of the following conditions:

1. It is markedly separated from other populations of the same taxon as a consequence of physical, physiological, ecological, or behavioral factors; or
2. It is delimited by international governmental boundaries within which differences in control of exploitation, management of habitat, conservation status, or regulatory mechanisms exist that are significant in light of section 4(a)(1)(D) of the Act.

In the case of Alaska-breeding Steller's eiders, the population is discrete by both criteria above. First, Alaska breeding Steller's eiders are physically separated from Asia nesting populations by hundreds of kilometers across the Bering and Chukchi seas. Second, the Alaska breeding population of Steller's eiders is delimited by international boundaries. Within these international boundaries differences in conservation status exist. While available information suggests that the species in Russia also may have declined, population numbers are estimated to range over 70,000 birds. However, the status of the breeding population in the U.S., as inferred by the contraction of nesting range, is reduced considerably from historic times, despite the existence of regulatory protections and an abundance of seemingly suitable habitat.

In 1997 the Service, based in part upon the recommendation of five independent sea duck or eider experts, determined the Alaska-breeding population be listed as threatened because of:

- 1) A substantial decrease in the species' nesting range in Alaska;
- 2) A reduction in the number of Steller's eiders nesting in Alaska; and
- 3) An increased vulnerability of the remaining breeding population to extirpation.

The entire Pacific population was not listed because the worldwide population remained sizable.

12. FUTURE DISCUSSION ON THE PROJECT

Request to continue further discussions with the ADFG and AMBCC

We appreciate the the ADFG's desire to continue further discussion and are willing and available to engage in further communications. We have also committed to continuing discussions with the AMBCC group and will provide updates at the AMBCC meetings.

14. Appendix 7: Service Compliance Process for Conducting Predator Control on National Wildlife Refuges

This appendix outlines the Service's - Alaska Region's current evaluation process required to undertake a predator control program on the YDNWR to support the reintroduction of Steller's eiders.

The Service is responsible for managing national wildlife refuges. As the responsible land manager for these refuges, the Service acknowledges that predators, including foxes, can affect prey population levels and are a key component of the ecosystem. The Service considers predator management a legitimate conservation tool when applied in a prudent and ecologically sound manner and when other alternatives are not practical. When predator management proposals or actions are in conformance with laws, regulations, and agency policies that govern management of national wildlife refuges, they would be considered by the Service.

History

Steller's eiders were once regularly observed nesting on the YKD; however, very few nests have been identified in recent decades. As a result of population decline the Alaska-breeding population of Steller's eiders was listed as threatened in 1997. The Service proposes to reintroduce Steller's eiders to the central coast area of the YKD in order to reestablish a viable western Alaska subpopulation of breeding Steller's eiders, one of the key recovery criteria for the species. Returning the species to one of its former nesting areas also enhances the biological diversity of the YDNWR. See the EA for further background on the population status of this species.

Proposal

Avian and mammalian predators could prey upon Steller's eiders eggs or ducklings during reintroduction reducing the success of these efforts. The primary mammalian nest predators in the coastal zone of the YKD are foxes, although mink are present in some areas (B. McCaffery and J. Schmutz, pers. comm.). Avian predators include gulls and jaegers. The Service is considering implementing temporary localized predator management efforts at release sites to improve nest success and survival rates. Predator management may include passive predator exclusion such as fencing, and/or deterrents. However, mammalian predators, particularly foxes, may be lethally removed by shooting and / or some form of trapping.

The reintroduction project is being developed in an adaptive management framework such that the project may change and adapt over time as we learn from successes and failure and new information. During the initial releases in 2016 the Service proposes to carry out a short duration, localized, lethal removal of foxes by shooting and /or trapping at the 2016 release site (Kigigak Island). This lethal removal of foxes would be limited to the period immediately prior to and during the nesting and early brood rearing period. In addition to these temporal limits, lethal removal of foxes will occur only at and immediately adjacent to the release site (i.e., only on Kigigak Island). Based on previous predator control work on the YKD to protect Brandt colonies, we estimate <20 foxes would be removed. Given the relatively low number of animals which may be lethally removed, the limited spatial extent of any predator control efforts, and the short duration of the effort (limited to a few weeks), we expect impacts to the fox population

would be localized, and temporary in nature, and will not significantly impact the population of foxes or ecosystem of the YKD.

Evaluation

This appendix describes the regulations, laws and policies as well as the biological context which the Service is considering when evaluating this predator control proposal on the YDNWR.

The Legal Context: The principal federal statutes affecting the management of predators and their prey on refuges are the Alaska National Interest Lands Conservation Act (ANILCA); the National Wildlife Refuge System Administration Act, as amended by the National Wildlife Refuge System Improvement Act of 1997, (Refuge Administration Act); the Wilderness Act, where applicable, and the NEPA. The Service follows the regulations and policies which implement those laws. Key provisions of these laws that pertain to refuge decisions on predator management follow:

1. ANILCA expanded the YDNWR in 1980 and set forth the primary purposes for the refuge. These purposes include: “to conserve fish and wildlife populations and habitats in their natural diversity including, but not limited to shorebirds, seabirds, tundra swans, emperor, white-fronted, and Canada geese, black brant and other migratory birds, salmon, muskox, and marine mammals.” Both foxes and Steller’s eiders are part of the overall diversity of fauna of the YDNWR. Localized, short duration fox control will likely increase the probability of reestablishing a breeding population of Steller’s eiders and is not anticipated to have long-term, large-scale negative effects on the fox population or other components of the ecosystem. This reintroduction effort has the potential to enhance the natural diversity of the refuge and will benefit multiple purposes of the refuge.

2. Refuge Administration Act mandates that, in administering the National Wildlife Refuge System (System) the Service shall “provide for the conservation of fish, wildlife, and plants, and their habitats” and “ensure that the biological integrity, diversity, and environmental health of the System are maintained for the benefit of present and future generations of Americans.” Both the Refuge System Improvement Act and ANILCA require refuge uses to be compatible with their purposes.

In 2001, to implement provisions of the Refuge Administration Act, the Service established the Biological Integrity, Diversity, and Environmental Health Policy to describe the relationships among refuge purposes, the mission of the national wildlife refuge system (System), biological integrity, diversity and environmental health of refuge resources. Biological integrity is defined as the biotic composition, structure, and functioning at genetic, organism, and community levels comparable with historic conditions, including the natural biological processes that shape genomes, organisms, and communities (601 FW 3.6B). The policy provides guidance on maintaining these elements of diversity and on restoring lost or degraded elements of integrity, diversity, and environmental health at the refuge scale and other appropriate landscape scales where it is feasible and supports the achievement of refuge purposes and the System mission (601 FW 3.7D). Under this policy, the Service favors management that restores or mimics natural ecosystem processes or functions to achieve refuge purposes (601 FW 3.7E).

3. NEPA

The potential effects of predator control, notably the lethal removal of foxes, associated with the Steller's eider reintroduction project have been evaluated under NEPA as part of the EA "Reintroduction of Steller's Eiders to the Yukon-Kuskokwim Delta, Alaska.

4. Wilderness Act

This area is not within a designated Wilderness area so it is not applicable.

The Biological Context

When considering a request/proposal for predator control on National Wildlife Refuges in Alaska, the refuge manager will determine whether a proposed predator management program is consistent with the refuge purposes and the Biological Integrity, Diversity, and Environmental Health Policy, and other laws, regulations and policies. In this analysis we considered the following alternatives:

1. Environmental manipulation, i.e., biological control, habitat management techniques not involving chemicals lethal or injurious to vertebrates.

There are no habitat management techniques or biological control methods which could be applied that would reduce or eliminate arctic foxes from the release site and not result in other significant, deleterious effects to the habitat and species which rely on it.

2. Live trapping and transfer.

While it may be possible to live trap foxes and remove them from the release site at Kigigak Island this method would be financially expensive and would result in additional impacts to nesting waterfowl through disturbance from trapping and transfer operations.

3. Public harvest of target wildlife through public hunting, fishing, and trapping.

Fox trapping by local residents (Newtok) may occur in the area; however, it is not of sufficient localized intensity to remove foxes from Kigigak Island prior to and during the waterfowl nesting period. By conducting a small-scale, localized, limited duration, predator control action the small number of foxes which could depredate Steller's eider eggs or ducklings can be targeted while the remaining, larger population on the rest of the YKD is not affected by the predator control action.

4. Repellants – non-lethal

No method to repel foxes from the project area has been identified.

5. Physical or mechanical protection (barriers, fences, etc.).

Constructing mechanical protection barriers such as fences would be extremely expensive and challenging and could result in habitat impacts. In addition, foxes would have to be removed from within any fenced area. Because Kigigak is an island once foxes have been removed from

it in the spring, the surrounding waters serve as a physical barrier to recolonization during the summer months when Steller's eider nests and broods are present.

Foxes are a common predator on the YKD and are known to prey on ground nesting birds, their eggs, and ducklings. The aim of the proposed predator control is to increase the probability of survival of released Steller's eider eggs and duckling. These eggs and duckling are to be released to the wild in an effort to reintroduce this species to its former range and meet one of the recovery criteria for this listed species. If the project is successful, this will return a species to the YKD ecosystem, increasing its natural diversity. Only a very small fraction of the YDNWR and its fox population would be subject to predator control. In 2016 fox control would only occur on Kigigak Island an area of approximately 8,031 acres which is a tiny area when compared to the 19.2 million acres which comprise the Refuge. In addition to the spatial limits, fox control would be temporally limited, and only occur immediately prior to and during the nesting and brood rearing period. Based on previous fox control work on the island, we estimate that <20 animals may be lethally taken, a tiny fraction of the YKD's fox population. The removal of this low number of foxes should not affect any of the Refuge purposes including traditional subsistence practices. While fur trapping may take place on Refuge lands this activity is predominantly a winter pursuit (for ease of access and higher fur quality). Further, the targeted, very localized removal of a low number of foxes should not result in a significant decrease in the overall fox population of the area and hence not significantly affect the availability of foxes for harvest.

Implementation

As described in the Steller's eider reintroduction EA, this project is being conducted within an adaptive management framework. All field aspects of the project, including potential predator control, have a monitoring component so the efficacy of an action can be evaluated.

Conclusion

Based on the information presented, this proposal can be authorized in accordance with the refuge purposes, laws, regulations and policies governing management of the YDNWR. This project is a refuge management activity and is deemed compatible with the purposes of the refuge.