3.14 THREATENED AND ENDANGERED SPECIES

The Threatened and Endangered Species Section addresses Endangered Species Act (ESA) listed birds and marine mammal species. Analysis was based within the EIS Analysis Area unless otherwise noted. Non-ESA listed wildlife species (terrestrial mammals, marine mammals, and birds) are addressed in Section 3.12, Wildlife.

SYNOPSIS

This section describes current conditions and evaluates potential impacts to threatened and endangered bird and marine mammal species from the proposed action and alternatives. Each alternative is examined by major project component (Mine Site; Transportation Corridor; and Pipeline) by project phase (Construction, Operations, Closure). Biological Assessments are provided in Appendix O.

EXISTING CONDITION SUMMARY

The Endangered Species Act of 1973 (ESA) provides for conservation of fish, wildlife, and plant species considered to be at risk of extinction (threatened or endangered) in all or a substantial portion of their ranges, and to conserve ecosystems and habitats upon which they depend. The U.S. Fish and Wildlife Service (USFWS) and National Marine Fisheries Service (NMFS) share regulatory authority for implementing ESA for the threatened and endangered species potentially affected by the proposed action and alternatives. Listed species are eligible for increased protective measures, including critical habitat designation.

Birds - The two ESA-listed bird species identified as threatened that could be affected by the project include Steller's eider and spectacled eider. These species may be present at the mouth of the Kuskokwim River, in Kuskokwim Bay, and in the Bering Sea, and are not likely to be found more than 56 miles inland. Another bird species listed as endangered, the short-tailed albatross, may occur along the marine portion of the Transportation Corridor; however, sightings of this species in this area are extremely rare.

Marine Mammals - ESA-listed marine mammals, including pinnipeds (seals, sea lions, and walruses) and cetaceans (whales, dolphins, and porpoises), occur within the water-based portions of the Transportation Corridor in Kuskokwim Bay and the Kuskokwim River, in the eastern Bering Sea, and in upper Cook Inlet. More specifically, ESA-protected and candidate pinniped and cetacean species found within or adjacent to the EIS Analysis Area include western stock of Steller sea lion, bearded seal, ringed seal, Pacific walrus, Cook Inlet stock of beluga whale, humpback whale, fin whale, North Pacific right whale, and northern sea otter.

EXPECTED EFFECTS SUMMARY

Alternative 1 - No Action

Birds: At the Mine Site, mineral exploration and reclamation of existing exploration and related disturbance (camp, roads, and airstrip) would continue. As current activities only occur at the Mine Site, ESA-listed birds would not be impacted as these species do not occur here.

Marine Mammals: At the Mine Site, mineral exploration and reclamation of existing exploration and related disturbance (camp, roads, and airstrip) would continue. As current activities only occur at the Mine Site, ESA-listed marine mammals would not be impacted as these species do not occur here.

Alternative 2 - Donlin Gold's Proposed Action

Birds: At the Mine Site during all three phases there would be no impacts to ESA-listed bird species because these species do not occur there. In the Transportation Corridor, there may be direct or indirect impacts to Steller's or spectacled eiders from an increase of 30 ocean barge trips (Construction Phase) and 26 ocean barge trips (Operations Phase) per year (up from baseline trips). Impacts may include behavioral changes from increased barge traffic; injury or mortality from collisions with barges; or contamination, injury, or death from a fuel or chemical spill. In the Closure Phase, there would be reduced impacts as there would be less ocean and barge traffic. In the Pipeline component during all three phases there would be no impacts to ESA-listed bird species because these species do not occur there. Alternative 2-North Option would have the same impacts.

Marine Mammals: At the Mine Site during all three phases there would be no impacts to ESA-listed marine mammals because these species do not occur there. In the Transportation Corridor, there may be direct or indirect impacts to ESA-listed marine mammals during the Construction Phase from an increase of 89 river barge trips and 30 ocean barge trips, and during the Operations Phase from an increase of 122 river barge trips and 26 ocean barge trips per year (up from baseline trips). Impacts may include behavioral changes from increased ocean barge traffic; injury or mortality from collisions with barges; or contamination, injury, or death from a fuel or chemical spill. During the Closure Phase, there would be reduced impacts as there would be less ocean barge traffic. Due to the rare occurrence and scattered distribution of North Pacific right whales, there may be population-level effects should an individual of this species experience a vessel strike. In the Pipeline component, during the Construction Phase, there may be direct or indirect impacts from an increase of 20 ocean barge trips for the first year of pipeline construction, with potential for population concern if a Cook Inlet beluga is struck due to Critical Habitat Area designation in Cook Inlet. Alternative 2-North Option would have the same impacts.

OTHER ALTERNATIVES – This section discusses differences of note between Alternative 2 and the following alternatives, but does not include a comprehensive discussion of each alternative's impacts if they are the same as or similar to Alternative 2 impacts.

Alternative 3A - LNG Powered Trucks

Birds: In the Transportation Corridor, reducing the number of ocean barge trips from 26 to 17 trips per year (Operations Phase), reduces but does not eliminate the potential for adverse impacts including behavioral changes from increased barge traffic; injury or mortality from collisions with barges; or contamination, injury, or death from a fuel or chemical spill, to Steller's and spectacled eiders.

Marine Mammals: In the Transportation Corridor, reducing the number of river barge trips from 122 to 83 trips (Operations Phase) and ocean barge trips from 30 to 20 trips per year (Construction Phase) and from 26 to 17 trips per year (Operations Phase), reduces but does not eliminate the potential for adverse impacts including behavioral changes from increased barge traffic; injury or mortality from collisions with barges; or contamination, injury, or death from a fuel or chemical spill, to ESA-listed marine mammals.

Alternative 3B - Diesel Pipeline

Birds: In the Transportation Corridor, reducing the number of ocean barge trips from 26 to 12 trips per year (Operations Phase), reduces but does not eliminate the potential for adverse impacts including behavioral changes from increased barge traffic; injury or mortality from collisions with barges; or contamination, injury, or death from a fuel or chemical spill, to Steller's and spectacled eiders. In the Pipeline component, there may be direct or indirect impacts from an additional 12 ocean fuel barge trips to Tyonek during the Operations Phase.

Marine Mammals: In the Transportation Corridor, reducing the number of river barge trips from 122 to 64 trips (Operations Phase), and ocean barge trips from 26 to 12 trips per year (Operations Phase), reduces but does not eliminate the potential for adverse impacts including behavioral changes from increased barge traffic; injury or mortality from vessel strikes; or contamination, injury, or death from a fuel or chemical spill, to ESA-listed marine mammal species. In the Pipeline component, an additional 12 ocean barge trips per year (Operations Phases) across Cook Inlet to Tyonek increases the potential for population concern if a Cook Inlet beluga is struck due to Critical Habitat Area designation in Cook Inlet.

Alternative 5A - Dry Stack Tailings

Marine Mammals: In the Transportation Corridor, increasing the number of river barge trips from 122 to 129 trips (Operations Phase) slightly increases the potential for adverse impacts including behavioral changes from increased barge traffic; injury or mortality from vessel strikes; or contamination, injury, or death from a fuel or chemical spill, to ESA-listed marine mammal species.

3.14.1 REGULATORY FRAMEWORK

The Endangered Species Act of 1973 (ESA) provides for conservation of fish, wildlife, and plant species considered to be at risk of extinction (threatened or endangered) in all or a substantial portion of their ranges, and to conserve ecosystems and habitats upon which they depend. The USFWS and NMFS share regulatory authority for implementing the ESA. The USFWS manages ESA-listed terrestrial and freshwater plant and animal species. NMFS is responsible for anadromous and marine fish species and most marine mammals, except for walrus, polar bears, sea otters, and manatees, which are under the jurisdiction of the USFWS.

Species placed on the ESA list of threatened and endangered species are eligible for increased protective measures, including critical habitat designation. Either NMFS or USFWS is responsible for developing recovery plans that identify conservation measures that will enhance the recovery and eventual delisting of listed species. The ESA protects listed species in regard to takings and adverse impacts on habitats. Listed species must be taken into consideration when development or land management actions are proposed.

Section 7 of the ESA requires all federal agencies to consult with the USFWS and/or NMFS when any action undertaken, funded, or permitted through the agency may affect an ESA-listed species or critical habitat. If the proposed action may affect listed species, the agency may prepare a Biological Assessment. Within this document, references to impact determinations specifically related to ESA-listed species discussed in Biological Assessments apply ESA Section 7 specific language for determinations. Generally, one of the following three determinations is applied: "no effect," "may affect, but not likely to adversely affect," or "may affect, and is likely to adversely affect."

3.14.2 ESA-PROTECTED, CANDIDATE, AND DELISTED BIRD SPECIES

3.14.2.1 AFFECTED ENVIRONMENT

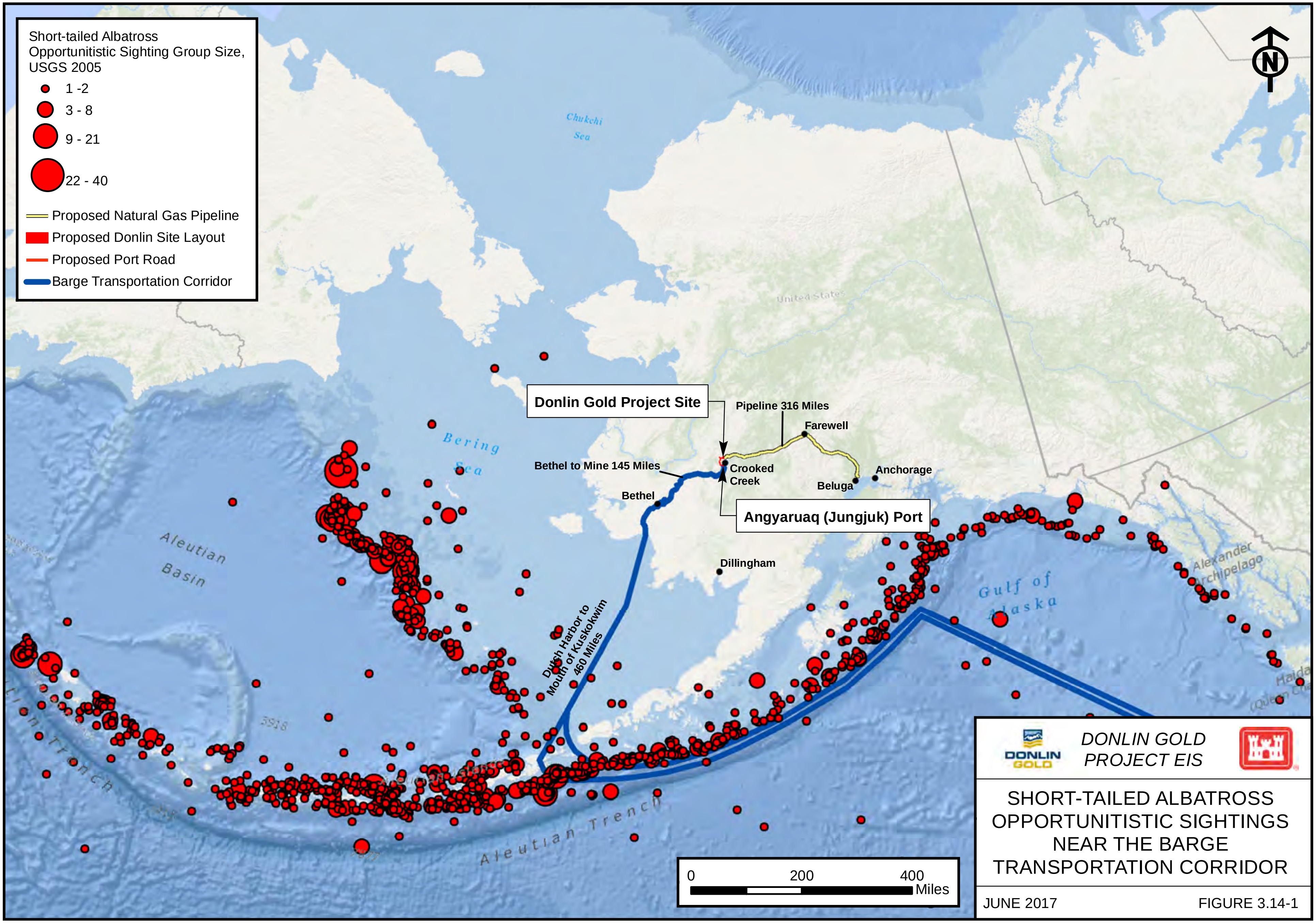
Two ESA-listed bird species that could be affected by the project include Steller's eider (Polysticta stelleri); and spectacled eider (Somateria fischeri), both listed as threatened.

Another bird species listed as endangered, the short-tailed albatross (Phoebastria albatrus), may occur along the marine portion of the Transportation Corridor. This species is not expected to be affected by project-related barge traffic as the chance of interaction is very unlikely given the large area involved, and the fact that sightings of this species along the marine portion of the Transportation Corridor are extremely rare, as shown in Figure 3.14-1. Non-fishing related vessel traffic is not known to affect this species (USFWS 2008).

As shown in Figure 3.14-2, both eider species may be present at the mouth of the Kuskokwim River, in Kuskokwim Bay, and in the Bering Sea, but are not likely to be found in inland areas. Steller's eiders are known to molt and winter near Dutch Harbor. Figure 3.14-3 is a closer view of the area near the mouth of the Kuskokwim River where they are known to concentrate.

3.14.2.1.1 MINE SITE

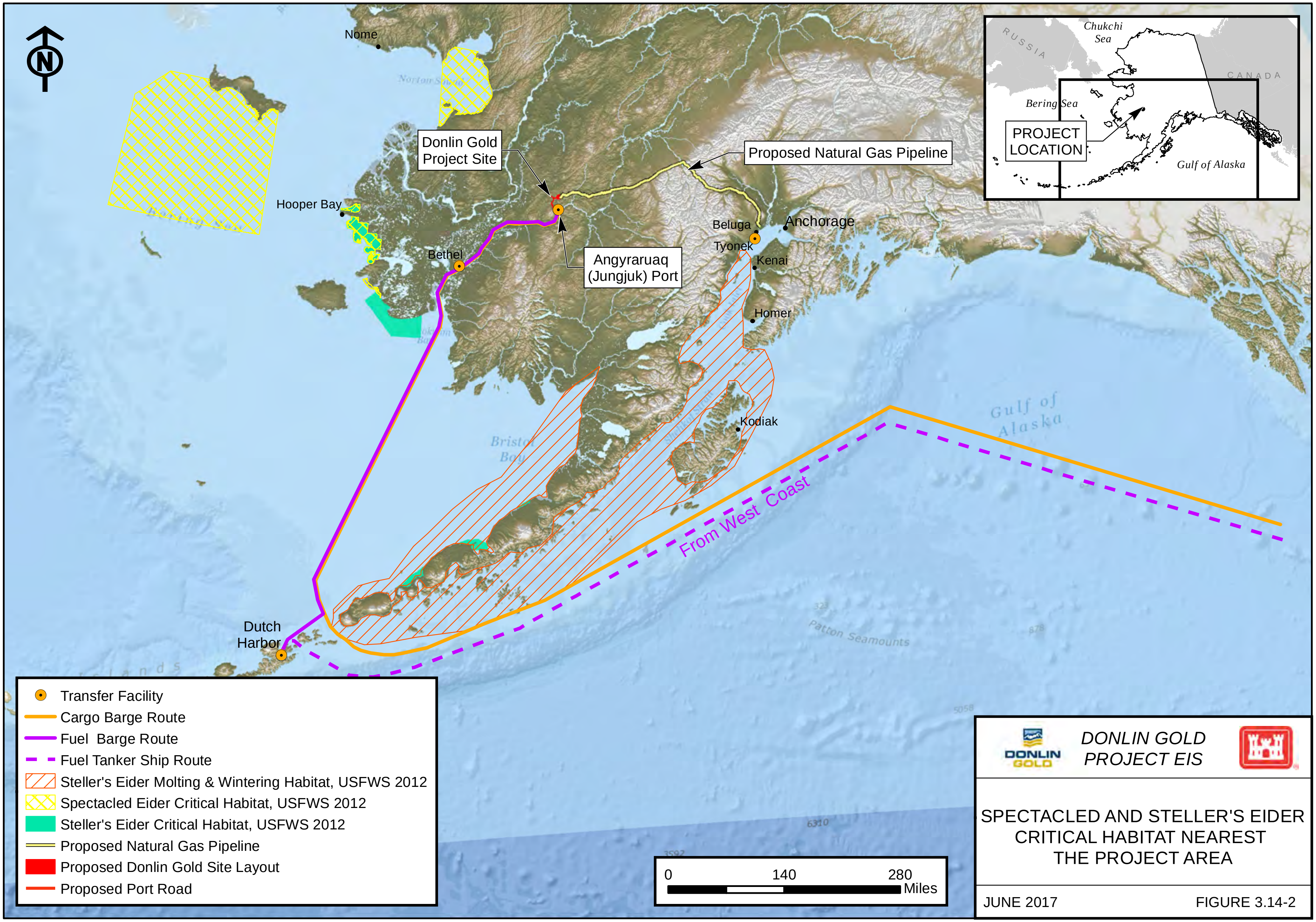
No eiders were observed in the vicinity of the Mine Site during any of the 2004-2013 bird surveys. Neither of the listed eiders is expected to occur in the vicinity of the mine because the site is so far inland of their preferred habitat. Both Steller's and spectacled eiders spend most of the year in shallow, nearshore marine waters, and nest on wet, coastal tundra near ponds or drained lake basins, generally near the coast. Steller's eiders are known to range at least as far as 56 miles inland (USFWS 2002), and on the Yukon-Kuskokwim (Y-K) Delta spectacled eiders breed mostly within 9 miles of the coast, but have been seen up to 60 miles inland (66 FR 9146). The Mine Site is approximately 160 miles from the nearest coastline.



SHORT-TAILED ALBATROSS OPPORTUNITISTIC SIGHTINGS NEAR THE BARGE TRANSPORTATION CORRIDOR

JUNE 2017

FIGURE 3.14-1

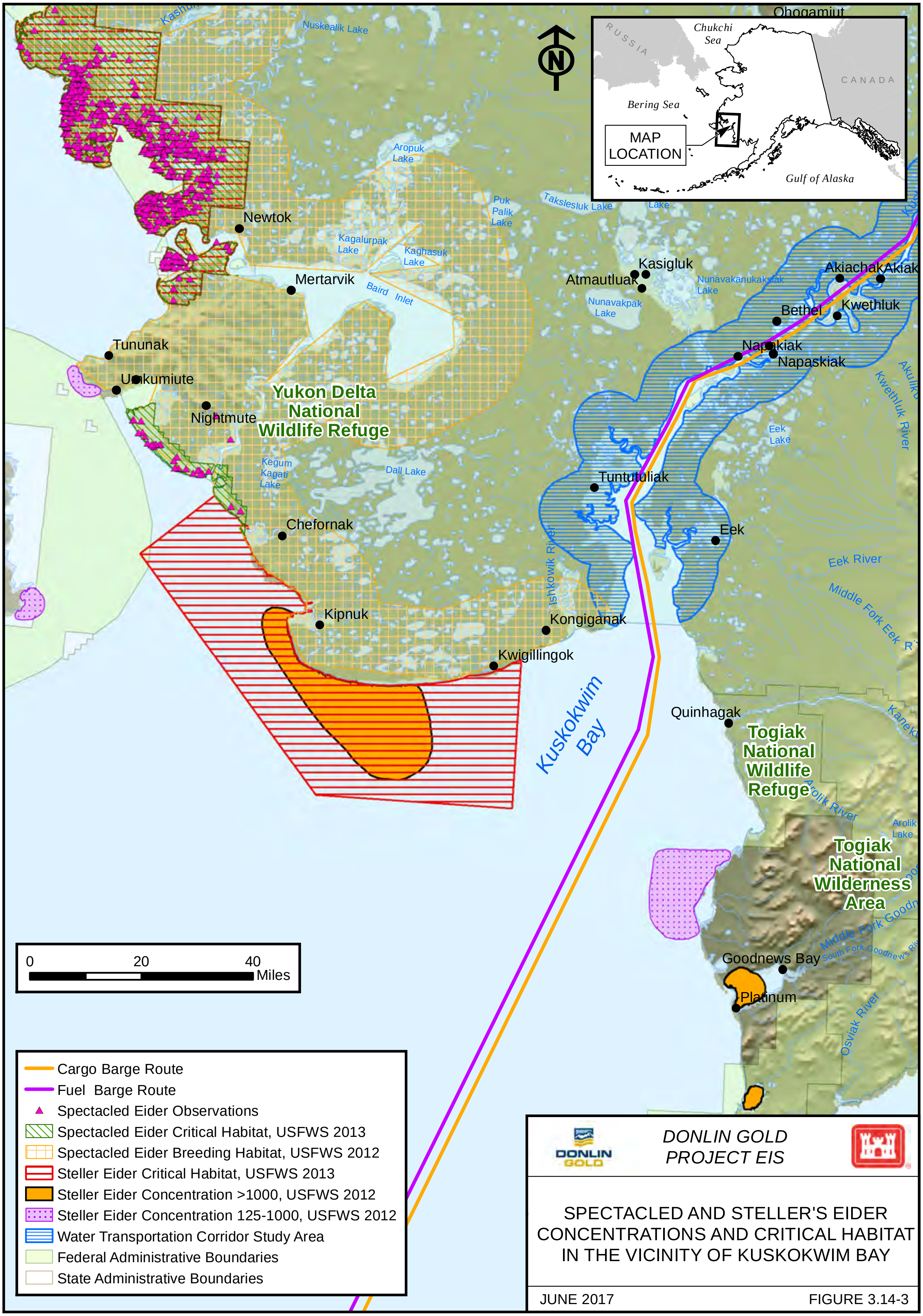


DONLIN GOLD PROJECT EIS

SPECTACLED AND STELLER'S EIDER CRITICAL HABITAT NEAREST THE PROJECT AREA

JUNE 2017

FIGURE 3.14-2



SPECTACLED AND STELLER'S EIDER CONCENTRATIONS AND CRITICAL HABITAT IN THE VICINITY OF KUSKOKWIM BAY

JUNE 2017

FIGURE 3.14-3

3.14.2.1.2 TRANSPORTATION CORRIDOR

Steller's Eider

Large numbers of Steller's eiders use habitat within Kuskokwim Bay for spring staging and during a three week molt period following breeding. During their molt they are unable to fly and are vulnerable to disturbances. After molting, Steller's eiders disperse throughout southwest and southcentral Alaska. During the early spring, it is thought that the entire Alaska overwintering population of Steller's eiders spend anywhere from days to a few weeks in northern Kuskokwim Bay before leaving for northern nesting areas (Larned 2007). It should be noted that the USFWS (2016) estimates that only a small proportion (less than one percent) of Steller's eiders at Kuskokwim Shoals are thought to be from the listed Alaska-breeding population.

The USFWS has designated Steller's eider critical habitat in Kuskokwim Bay around Kuskokwim Shoals (from the mouth of the Kolavinarak River to near Kwigillingok village), in the northwest portion of the bay (Figure 3.14-3).

Although Waterway Corridor Surveys were conducted for four years (2006-2009), eiders were only seen in 2009 (RWJ 2010b). One spectacled eider was identified near Fowler Island, and one King Eider seen near Tuntutuliak, but the remaining 17 sightings were recorded as unidentified eiders. Seven birds were seen in June, and twelve in August, both groups were seen from the same Fowler Island station, but were too far away and seen too briefly to make a positive identification. It was noted that the group of seven seen in June could possibly be spectacled eiders, but the other 12 were not identifiable. No eiders were seen during the June 18-19, 2013 boat survey of the Kuskokwim River from Crooked Creek to Bethel (Owl Ridge 2013b).

The following summary of Steller's eiders life history is limited to those aspects that are relevant to the discussion of potential impacts that follows.

Steller's eiders are small diving ducks that spend most of the year in shallow, nearshore marine waters. During the fall and winter they congregate on exposed shoals, in protected lagoons and bays, and along rocky headlands and islets. They feed by diving and dabbling for mollusks and crustaceans in shallow water. In summer, they nest in tundra adjacent to small ponds or within drained lake basins and frequent tundra ponds, lakes, and wetlands (USFWS 2012b).

Three breeding populations are recognized, two in Arctic Russia and one in Alaska. Only Steller's eiders that nest in Alaska are listed as threatened. Individuals from the Russian breeding populations that may also occur in the EIS Analysis Area are not protected by the ESA. In Alaska, the northern breeding population historically nested along the northern Arctic Coastal Plain from Wainwright to Cape Halkett. The western breeding population was reported nesting on the Seward Peninsula, St. Lawrence Island, and southern Norton Sound, but primarily nested on the central Y-K Delta. Steller's eiders now breed almost exclusively on the Alaska Coastal Plain. Based on aerial surveys near Barrow, the Alaska-breeding population is thought to number about 500 individuals (USFWS 2011).

The Steller's eider was a common nester in the Y-K Delta area during the first half of the twentieth century (USFWS 2013c). In 1997, the Alaska breeding population was listed as threatened under ESA due to the contraction of the species breeding range in Alaska, reduced numbers of Steller's eiders breeding in Alaska, and the resulting vulnerability of the remaining breeding population to extirpation. Steller's eiders historically nested in western and northern

Alaska. In addition to the Y-K Delta, they were recorded nesting on St. Lawrence Island, the Seward and Alaska peninsulas, and the Aleutian Islands. While they historically nested on the Y-K Delta, only a few nests have been found there in recent years. On June 21, 2013, researchers discovered an active Steller's eider nest on the central coast of the Y-K Delta while conducting other research. This is the first nest observed in western Alaska since 2005 (USFWS 2013c).

In 2001, the USFWS designated 2,830 square miles of critical habitat for the Alaska-breeding population of Steller's eiders at historic breeding areas on the Y-K Delta, a molting and staging area in the Kuskokwim Shoals, and molting areas in marine waters at Seal Islands, Nelson Lagoon, and Izembek Lagoon (66 FR 8850). Approximately 2,800 square miles and 850 miles of coastline are included in critical habitat (USFWS 2012b). Figure 3.14-2 shows the areas of critical habitat closest to the Project Area.

Fall Molt Distribution

After breeding, Steller's eiders move to marine waters where they mix with birds from the Russian breeding population and undergo a three week flightless molt. The Pacific-wintering population molts in several main areas along the Alaska Peninsula: Izembek Lagoon (Metzner 1993; Dau 1991; Laubhan and Metzner 1999), Nelson Lagoon, Herendeen Bay, and Port Moller (Gill et al. 1981; Petersen 1981). Over 15,000 Steller's eiders have also been observed in Kuskokwim Bay (Larned and Tiplady 1996). A recent study tracked molting Steller's eiders from late August to Early October along the Kuskokwim Shoals in waters up to 30 meters deep (Martin et al. 2015).

Winter Distribution

After molt, many of the Pacific-wintering Steller's eiders congregate in select near-shore waters throughout the Alaska Peninsula and the Aleutian Islands, around Nunivak Island, the Kodiak Archipelago, and in lower Cook Inlet, although thousands may remain in lagoons used for molting (Bent 1987; Larned 2000; Larned and Zwiefelhofer 2002). The number of Steller's eiders molting and wintering along the Alaska Peninsula has declined since the 1960s. At 54,191, the 2002 Pacific population estimate by Larned (2002) was the lowest recorded since aerial surveys were initiated in 1992 (USFWS 2012a).

Spring Migration

The majority of the world's population of Steller's eiders migrates along the Bristol Bay coast of the Alaska Peninsula in the spring, crosses Bristol Bay toward Cape Peirce, then continues northward along the Bering Sea coast. Annual spring aerial surveys to monitor the population of Steller's eiders migrating northward in southwestern Alaska have been conducted in 1992, 1993, 1994, 1997, 1998, 2000, 2001 and 2002. The long-term trend (1992-2012) indicates an annual decline of 2.4 percent per year (Larned 2012).

Steller's eiders show strong site fidelity to "favored" habitats during migration, where they congregate in large numbers to feed before continuing their northward migration. Several areas receive consistent use during spring migration, including Kuskokwim Bay (Larned 1998).

Spring pre-migration staging surveys conducted between 1992 and 2009 in southwestern Alaska revealed a persistent pattern of habitat use by Steller's eiders and most other sea duck species. This pattern is evidence of the importance of certain areas, including Kuskokwim Bay, to staging and migrating waterfowl (Larned and Bollinger 2009).

A Steller's eider recovery team considered reintroducing the Steller's eider to the Y-K Delta using a captive flock raised at the Alaska SeaLife Center (USFWS 2013c). The near-disappearance of Steller’s eiders from the Y-K Delta was one of the primary factors leading to the listing of the Alaska breeding population as threatened under ESA. Consequently, reestablishment of the species to the Y-K Delta was considered essential for recovery (USFWS 2002).

Spectacled Eider

The current breeding range of spectacled eiders includes the coastal area from the west side of the mouth of the Kuskokwim River north and west along the coast. There is no critical habitat for spectacled eiders within or adjacent to the EIS Analysis Area (Figure 3.14-2). Small numbers of spectacled eiders may molt near Kipnuk, on the northwestern land portion of Kuskokwim Bay, where 117 spectacled eiders were observed during an aerial survey in September 1994 (USFWS 1996). A more extensive survey in September 1996 did not locate any spectacled eiders in Kuskokwim Bay (Larned and Tiplady 1996). During 15 years (1992 to 2009) of spring staging surveys of estuarine and near shore habitats along the coast of southwestern Alaska, from the Y-K Delta to the west end of the Alaska Peninsula, the number of spectacled Eiders dropped from 40 in 1992 to 0 in 2001, and none have been observed during the surveys since (Larned and Bollinger 2009).

The following summary of spectacled eiders’ life history is limited to those aspects that are relevant to the discussion of potential impacts that follows.

Spectacled eiders are large diving ducks that spend most of the year in marine waters, where they feed primarily on bottom-dwelling mollusks and crustaceans. From November through March or April, they remain in open sea or in polynyas (areas of open water at predictable, recurrent locations in sea ice covered regions), or open leads (more ephemeral breaks in the sea ice, often along coastlines) in the sea ice of the northern Bering Sea at water depths of less than 240 feet (Petersen et al. 2000). In spring, breeding pairs move to nesting areas on wet coastal tundra and establish nests near shallow ponds or lakes.

As recently as the 1960s, about 50,000 pairs of spectacled eiders nested on the Y-K Delta in western Alaska. By 1992, only about 2,000 nesting pairs remained and an average of about 5,000-6,000 nest on the Y-K Delta today (USFWS 2012b). Between the 1970s and the 1990s, the breeding population of spectacled eiders on the Y-K Delta declined by over 96 percent. The causes of this steep decline remain unknown, but its magnitude prompted the USFWS to list the species as threatened under ESA in 1993.

Today, three primary nesting areas remain: the central coast of the Y-K Delta, the Arctic coastal plain of Alaska, and the Arctic coastal plain of Russia (USFWS 2012b). Important late summer and fall molting areas have been identified in eastern Norton Sound and Ledyard Bay in Alaska, and in Mechigmenskiy Bay and an area offshore between the Kolyma and Indigirka River Deltas in Russia. Wintering flocks of spectacled eiders have been observed in openings in sea ice in the Bering Sea between St. Lawrence and St. Matthew islands (USFWS 2010).

In its latest 5-year review, the USFWS (2010) reported that recent data suggest the Y-K Delta nesting population is increasing slightly.

3.14.2.1.3 PIPELINE

No eiders were observed in the vicinity of the Pipeline during any of the field surveys. Neither of the listed eiders is expected to occur near the Pipeline because most of this component is too far inland of their preferred habitat. Both Steller's and spectacled eiders spend most of the year in shallow, nearshore marine waters, and nest on wet, coastal tundra near ponds or drained lake basins, generally near the coast. Steller's eiders are known to range at least as far as 56 miles inland (USFWS 2002), and on the Y-K Delta spectacled eiders breed mostly within 9 miles of the coast, but have been seen up to 60 miles inland (66 FR 9146). Figure 3.14-2 shows that the portion of Cook Inlet close to the west end of the Pipeline is not known to be used by either eider species, although lower Cook Inlet, outside of the EIS Analysis Area, may be used as molting and wintering range by Steller's eiders (Larned 2006).

3.14.2.1.4 CLIMATE CHANGE

Climate change is affecting resources in the EIS Analysis Area and trends associated with climate change are projected to continue into the future. Section 3.26.3 discusses climate change trends and impacts to key resources in the physical and biological environments including atmosphere, water resources, permafrost, and vegetation. Current and future effects on birds are tied to changes in physical resources and vegetation (discussed in Section 3.26.4).

3.14.2.2 ENVIRONMENTAL CONSEQUENCES

This section describes potential impacts to ESA-listed bird species as a result of the project. Table 3.14-1 provides the impact methodology framework applied to assessing direct or indirect impacts to ESA-listed birds based on four factors of intensity or magnitude, duration, extent or scope, and context (40 CFR 1508.27, described in Section 3.0, Approach and Methodology).

ESA Section 7 Consultation conclusions, as a separate process but parallel process to NEPA, are summarized in the Summary of Alternative 2 section below, and described fully in the Biological Assessment (Owl Ridge 2017a, Appendix O). Biological Assessments were developed and the Corps requested initiation of informal consultation to the NMFS and USFWS on August 18, 2017. Eight species under ESA jurisdiction of NMFS are evaluated in the BA on the potential and magnitude of effect of barging activities to each of the listed species (Appendix O). Five species under ESA jurisdiction of the USFWS are evaluated in this BA on the potential and magnitude of effect of activities to each of the listed species (Appendix O).

3.14.2.2.1 ALTERNATIVE 1 – NO ACTION

Under the No Action Alternative, there would be no Mine Site development, no Transportation Corridor, and no Pipeline. Therefore, there would be no project-related impacts to threatened or endangered birds in the Project Area.

3.14.2.2.2 ALTERNATIVE 2 – DONLIN GOLD'S PROPOSED ACTION

The following is a general description of the sources or mechanisms of potential impacts to ESA-listed bird species. Details, such as behavior patterns and habitat, are described below under each project component.

Table 3.14-1: Impact Methodology for Effects on ESA-Listed Birds

Type of Effect	Impact Factor	Assessment Criteria		
Behavioral Disturbance	Magnitude or Intensity	Changes in behavior due to project activity may not be noticeable; animals remain in the vicinity.	Noticeable change in behavior due to project activity that may affect reproduction or survival of individuals.	Acute or obvious/abrupt change in behavior due to project activity; life functions are disrupted; animal populations are reduced in the EIS Analysis Area.
	Duration	Behavior patterns altered infrequently, but not longer than the Construction Phase and would be expected to return to pre-activity levels after actions causing impacts were to cease.	Behavior patterns altered for several years and would return to pre-activity levels (from the end of the Construction Phase through the life of the mine) after actions causing impacts were to cease.	Change in behavior patterns would continue even if actions that caused the impacts were to cease; behavior not expected to return to previous patterns.
Behavioral Disturbance (continued)	Extent or Scope	Impacts limited to vicinity of the Project Area.	Potentially affects resources throughout the EIS Analysis Area.	Affects populations distant from the Project Area.
	Context	Affects usual or ordinary resources in the EIS Analysis Area; resource is not depleted in the locality or protected by legislation.	Affects depleted species within the locality or region, or resources proposed as candidates or listed as threatened under the ESA but whose populations are currently stable, or the portion affected is not a large percentage of the population.	Affects species listed as endangered under the ESA, or those listed as threatened or proposed for listing under the ESA with small or declining populations.
Injury and Mortality	Magnitude or Intensity	Any incidents of injury or mortality are so rare they are undetectable; population level effects not detectable.	Incidents of injury or mortality are detectable; populations remain within normal variation.	Incidents of mortality or injury create population-level effects.
	Duration	Events with potential for mortality or injury would occur for a brief, discrete period lasting less than one year, or up to the duration of the Construction Phase.	Events with potential for mortality or injury would continue for up to the life of the project.	Potential for mortality or injury would persist after actions that caused the disturbance ceased.
	Extent or Scope	Impacts limited to vicinity of the Project Area.	Potentially affects resources throughout the EIS Analysis Area.	Affects populations distant from the Project Area.

Table 3.14-1: Impact Methodology for Effects on ESA-Listed Birds

Type of Effect	Impact Factor	Assessment Criteria		
	Context	Affects usual or ordinary species in the EIS Analysis Area; species is not depleted in the locality, listed under the ESA, or considered a Species of Concern.	Affects depleted species within the locality or region, or resources proposed as candidates or listed as threatened under the ESA but whose populations are currently stable, or the portion affected is not a large percentage of the population.	Affects species listed as endangered under the ESA, or those listed as threatened or proposed for listing under the ESA with small or declining populations.
Habitat Alterations[1]	Magnitude or Intensity	Changes in resource character or quantity may not be measurable or noticeable.	Noticeable changes in resource character and quantity.	Acute or obvious changes in resource character and quantity.
	Duration	Resource would be reduced infrequently but not longer than the span of 1 year and would be expected to return soon to pre-activity levels.	Resource would be reduced for up to the life of the project and would return to pre-activity levels long-term (from the end of construction through the life of the mine) after that.	Resource would not be anticipated to return to previous character or levels.
	Extent or Scope	Potentially affects resources throughout the EIS Analysis Area.	Affects populations distant from the Project Area.	Impacts limited to vicinity of the Project Area.
	Context	Affects usual or ordinary resources in the EIS Analysis Area; resource is not depleted in the locality or protected by legislation.	Affects depleted habitat within the locality or region or habitat protected by legislation other than the ESA.	Affects habitat protected by ESA legislation, such as designated critical habitat.

Notes:

1 Habitat alteration impacts are habitat changes and/or injury or mortality through contamination from fuel or chemical spills, discussed in Section 3.24, Spills.

For each type of impact, the design features that would mitigate or reduce the impact are also described. The impacts assessed under each alternative are those that remain following implementation of the design features detailed in Chapter 2. Specific mitigation measures that agencies are considering to further reduce impacts, as reasonable and practicable, are also discussed in Chapter 5, Impact Avoidance, Minimization, and Mitigation, along with an evaluation of their expected effectiveness.

Based on comments on the Draft EIS from agencies and the public, one route option has been included in Alternative 2 to address concerns due to pipeline crossings of the Iditarod National Historic Trail (INHT):

- North Option: The MP 84.8 to 112 North Option would realign this segment of the natural gas pipeline crossing to the north of the INHT before the Happy River crossing and remain on the north side of the Happy River Valley before rejoining the alignment near MP-112 where it enters the Three Mile Valley. The North Option alignment would be 26.5 miles in length, compared to the 27.2 mile length of the mainline Alternative 2 alignment it would replace, with one crossing of the INHT and only 0.1 mile that would be physically located in the INHT right-of-way (ROW). The average separation distance from the INHT would be 1 mile.

Mine Site – All Phases

Mine Site activities would have no impacts on either Steller's or spectacled eiders because neither species occurs there. The Mine Site is approximately 160 miles from the nearest coastline, while both eider species are sea ducks that nest in coastal tundra areas and spend the nonbreeding season at sea and generally are not found more than 56-60 miles inland (USFWS 2002 and FR 66 FR 9146).

Transportation Corridor – All Phases

The only project component that could impact the Steller's eider or the spectacled eider is the transportation of diesel fuel and general cargo via ocean-going barges as they transit from Dutch Harbor or the Unimak Pass area to and from the Kuskokwim River and upriver to the port at Bethel. The route across the Bering Sea and Kuskokwim Bay is expected to be within about a 10-mile wide corridor, narrowing in the Kuskokwim River (Figure 3.14-2).

The number and frequency of barge trips hauling materials down river during the Closure Phase would be lower than during either Construction or Operations, although a quantified number is not available.

Direct and indirect effects on these species could potentially include:

- Behavioral disturbance from increased barge traffic;
- Injury or mortality from collisions with barges; and
- Habitat changes and/or injury or mortality through contamination from fuel or chemical spills (addressed in Section 3.24, Spill Risk).

As described in above in Section 3.14.1, Section 7 of the ESA requires all federal agencies to consult with the USFWS and/or NMFS when any action undertaken, funded, or permitted through the agency may affect an ESA-listed species or critical habitat. If the proposed action may affect listed species, the agency may prepare a Biological Assessment, or accept an applicant-prepared one, to aid in determining the project's effects on listed species. The Corps approved Biological Assessments for submission to the USFWS and NMFS for review; these are included in this document in Appendix O.

Effects of barge trips south of Dutch Harbor or Cook Inlet are not analyzed because they are a small fraction of the typical shipping traffic to and from the Dutch Harbor vicinity and are within the range of variability of that shipping background.

In terms of context, the two species discussed in this section are ESA-protected or candidate bird species. Effects determinations in the Biological Assessment for ESA-listed bird species included within the scope of the EIS Analysis Area may be "no effect," "may affect, but not likely to adversely affect," or "may affect, and is likely to adversely affect." The action area of the Biological Assessment includes the barge corridor from Dutch Harbor, Alaska, to Bethel, Alaska (Owl Ridge 2017a, Appendix O). See Section 3.14.1, Regulatory Framework, above for further information.

Behavioral Disturbance

Studies on Steller's eiders show variable degrees of tolerance to vessel traffic. They commonly overwinter in areas of high activity near the Homer Spit and the Unalaska airport and do not flee in response to human activities on adjacent shorelines, but they have been observed to be sensitive to boat traffic in Izembek Lagoon (USFWS 2012a). In a study of responses of wintering waterfowl to aircraft traffic, Ward and Stehn (1989) found that Steller's eiders flushed when aircraft came within 300 meters. Disturbance from boat traffic can cause Steller's eiders to fly away from preferred foraging and resting sites, thereby disrupting foraging or resting periods. Disturbance of sufficient frequency, duration, or severity can lower individual fitness through increased time spent in flight and reduced time spent feeding or resting (USFWS 2012a).

Some studies have documented a variety of behavioral responses to vessel-related disturbance, including increased alert behavior, flight, swimming, and a reduction in foraging (Agness 2006). Waterbird responses to vessel traffic may be dependent on species, biological cycle (e.g., breeding, migrating, stopover, wintering), and / or vessel attributes (e.g., vessel type, size, speed, and distance from the birds). Schwemmer et al. (2011) found that flush distances of four sea duck species differed substantially, with the longest distances recorded for common scoters (*Melanitta nigra*) and the shortest for common eiders (*Somateria mollissima*), with flush distance being positively related to flock size. The study also found indications of habituation in sea ducks within areas of channeled traffic. Because the barge would follow established travel lanes and would not approach nearshore habitats used by molting Steller's eiders, the potential for disturbance or collisions in the vicinity of Kuskokwim Bay is limited. Steller's eiders could also be encountered during barge passage in and out of Dutch Harbor and Iliuliuk Bay, but these birds are expected to be accustomed to boat and ship traffic given the normal shipping and summer fishing activity at Dutch Harbor.

Figure 3.14-2 and Figure 3.14-3 show that the presence of both eider species within the EIS Analysis Area is generally limited to Kuskokwim Bay. Both the critical habitat and known concentration areas are several miles outside the barge corridor. The critical habitat is more than 10 miles from the nearest point on the barge corridor, and the concentration areas are 10 to 30 miles away. The extent or scope of impacts for behavioral disturbance is that the closest that barges may come to concentrations of either species may be where the cargo barges pass by the Alaska Peninsula where Steller's eiders molt. The cargo barges are expected to be farther offshore than the molting eiders, and the fuel barges traveling to Dutch Harbor are expected to be even farther offshore. The duration would be the time of barge passing an individual or population that was proximate to barge location; this would occur through the life of the project, but would not result in permanent behavior patterns after barge operations ceased. The magnitude is how many individuals would be impacted, which is expected to be a limited number of individuals, if any.

Spectacled eiders are known to nest on the coastal wetlands north and west of Kuskokwim Bay and may also molt nearer the EIS Analysis Area. Eiders are particularly vulnerable during the fall molting period, when they are unable to fly for approximately three weeks. Males, failed breeders, and nesting females molt at different times between June and October (USFWS 2010). At its closest point, near the mouth of the Kuskokwim River, the barge route is approximately 80 miles from known spectacled eider breeding habitat. It is much less likely that spectacled eiders would be encountered anywhere else along the barge route based on their rarity in the travel corridors during the summer months.

The temporal overlap that is expected to be most important in terms of likelihood of impacts is the cargo barges passing by part of the area where Steller's eiders molt; the birds would be most vulnerable at that time to behavioral impacts in terms of duration and extent of impacts. Nesting spectacled eiders may be close to the barges, but they would be shielded from effects by the intervening tundra on which they nest. Potentially, nesting spectacled eider individuals could be feeding in the Kuskokwim River nearer the passing barges, but they would be able to fly. During the early spring, it is thought that the entire Alaska overwintering population of Steller's eiders spend anywhere from days to a few weeks in northern Kuskokwim Bay before leaving for northern nesting areas (Larned 2007). Eiders wintering near Dutch Harbor would not be affected because they are there only during the late fall and winter months, when the barges would not be there. Table 3.14-2 demonstrates that project activities (ocean barge traffic) may occur at the same time that both eider species may be present, to illustrate the duration and extent of impacts.

Table 3.14-2: Temporal Overlap of Ocean Barge Traffic and Spectacled and Steller's Eider Presence in Kuskokwim Bay

	Jan	Feb	Mar	April	May	June	July	Aug	Sept	Oct	Nov	Dec
Barge traffic[1]												
Steller's Eider presence in Dutch Harbor[4]												
Steller's Eider fall molting (unable to fly)[2]												
Steller's Eider spring staging[2]												
Spectacled Eider breeding on coastal tundra areas[3]												

Notes:

Shaded cells indicate presence.

1. Barge traffic would use the ice-free period of the year, which varies in start and end dates.
2. Larned 2007, Steller's Eider Spring Migration Surveys
3. USFWS data from Figure 3.14-2
4. USFWS 2007

Steller's eiders gather in large flocks in Kuskokwim Bay during the spring for staging prior to migration to breeding areas, and also in the fall for molting. Kuskokwim Shoals, located in the northwest portion of Kuskokwim Bay, has been identified as critical habitat for Steller's eiders (66 FR 8850). Because the USFWS (2016) estimates that only a small proportion (less than one percent) of Steller's eiders at Kuskokwim Shoals are thought to be from the listed Alaska-breeding population, it is unlikely that a member of the listed population would be affected by the project, in terms of intensity.

Project-related marine traffic would be routed well to the south and east of the Kuskokwim Shoals and to the west of Chagvan Bay, which would avoid physical disturbance of eider concentrations by noise or movement (ARCADIS 2013a). Figure 3.14-2 and Figure 3.14-3 show the barge route is approximately 10 miles from the Steller's eider critical habitat, and about the same distance from the closest concentration area. Under Alternative 2, the increase in barge traffic within the barge season from the current estimated baseline number of 68 barge trips per year is outlined in Table 3.14-3. During Construction, there would be 16 ocean cargo barges and 14 ocean fuel barges, for a total of 30 barges per year. During Operations, there would be 12 ocean cargo barges per year, and 14 ocean fuel barges for a total of 26 barges per year. River barge traffic is also depicted, although river barge trips are not expected to have impacts on ESA-listed bird species as habitat does not occur in river barge shipping routes upstream of Bethel.

Table 3.14-3: Estimated Annual Ocean and River Barge Traffic under Alternative 2

Barge	Transporting	From	To	Number of Round Trips per Season	
				Construction	Operations
Ocean	Cargo	Seattle, WA or Vancouver, B.C. area	Bethel	16	12
Ocean	Fuel	Dutch Harbor	Bethel	14	14
Total cargo and fuel barges to Bethel				**30**	**26**
River	Cargo	Bethel	Angyaruaq (Jungjuk) Port Site	50[a]	64
River	Fuel	Bethel	Angyaruaq (Jungjuk) Port Site	19[b]	58
River	Pipe and Equipment	Bethel	Staging area near Devil's Elbow, above Stony River	20 during first two years of pipeline construction	0
Total river barges, Transportation Corridor Component				**89**	**122[c]**
Ocean	Pipe and Equipment	Anchorage	Beluga Landing	20 during first year of pipeline construction	0
Total ocean barges, Pipeline Component				**20**	**0**

Notes:

Baseline barge traffic typically consists of one or two 40-ft by 160-ft barges with a pusher tug.

a Total would be 200 trips over four years. Exact distribution by year would be determined during final design.

b Average number. Actual number would range from 9 to 29 annually.

c Number represents peak years.

Source: SRK 2013a, from Table 2.3-8 in Chapter 2, Alternatives

Injury or Mortality from Collisions

Steller's eiders are sea ducks that feed by diving in relatively shallow water, so they are likely to be near the shore and away from the barge corridor. The spectacled eiders' known breeding areas are about 80 miles north, but potential breeding areas may not be far in linear distance (as close as five miles) from the lower Kuskokwim River barge route, but the spectacled eiders nest on the tundra, which would provide an effective buffer from effects of the barges on the nesting habitat itself. Molting concentration areas are also many miles away in Norton Sound or Ledyard Bay. Smaller numbers of either species may occur in the barge corridor outside the concentration areas. They have been seen up to 56 miles from the coast. The extent or scope of impacts for injury or mortality from collisions is that scattered individuals may fly past barges, but are not likely to do so. The duration of the impact would be only those times in which an individual may fly past a barge during barge passage; this would occur through the life of the project, but would not result in permanent behavior patterns after barge operations ceased. The magnitude is how many individuals would be impacted, which is expected to be a limited number of individuals, if any.

Low-flying Steller's or spectacled eiders can be killed or injured by colliding with vessels. Fast moving passenger vessels have a higher potential for collisions with wildlife than slower barges and tugs. Although the probability of injury or death of an eider due to collision with a barge would increase with the additional project-related barge traffic, and the chance of collisions increases with fog or darkness, especially if the barge has many lights that could attract the birds, the risk is expected to be low because of the relatively slow speed of the barges (less than 10 knots). Therefore, no direct effects are expected to occur from collisions with barges, in terms of intensity of impacts.

Contamination and Fuel Spills

In addition to disturbance-related impacts, the additional barge traffic would increase the risk of impacts from spills. Spectacled eiders, their food source, and other habitat features could potentially be exposed to discharges and varying sized spills. This could occur from vessels transporting fuel and cargo, as well as to fuel spilled at any of several transfer points, including barge to storage tank transfer, or ocean barge to river barge transfer at the Bethel Port or in the event of a stranded barge that requires lightering of fuel. Section 3.24, Spill Risk, provides additional analysis of risks and potential impacts of spills from fuel barges and storage tanks along the marine and riverine transportation corridors.

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<u>Pipeline – All Phases</u>

Pipeline component activities, including 20 ocean barge trips during the first year of pipeline construction (Table 3.14-3), are not expected to have impacts on either Steller's or spectacled eiders because neither species occurs in this area. Both eider species are marine birds that generally are not found more than 56 miles inland (USFWS 2002 and 66 FR 9146). The eastern end of the Pipeline is located within 56 miles of Cook Inlet, but neither eider species is known to occur in upper Cook Inlet. Also, no nesting habitat for either species would be affected by the Pipeline component activities because they are not known to nest in any of the area traversed by the Pipeline component, although lower Cook Inlet, in areas outside of the EIS Analysis Area, may be used as molting and wintering range by Steller's eiders (Larned 2006).

Climate Change Summary for Alternative 2

Predicted overall increases in temperatures and precipitation and changes in the patterns of their distribution (Walsh et al. 2005; Chapin et al. 2006; Chapin et al. 2010; McGuire 2015) have the potential to influence the projected effects of the Project on vegetation, wetlands, and associated bird habitat. An overall warming/drying trend would tend to convert some wetlands to uplands and tend to increase the cover of shrubs and trees in previously open areas. Warming conditions may lead to increases in infectious disease in wildlife, or conditions that favor the release of persistent environmental pollutants that can affect the immune system and favor an increased disease rate (Bradley et al. 2005). Coastal dependent bird species such as spectacled eider may lose habitat if sea levels change (ADF&G 2010b). Changes in marine productivity could negatively affect food webs important to bird species, such as reduction in clam beds used in winter by spectacled eiders. See Section 3.26, Climate Change, for further details on climate change and resources.

Summary of Impacts for Alternative 2

Applying the methodology defined in Table 3.14-1 to the information and data presented in this section, Alternative 2 has potential direct and indirect impacts on threatened or endangered birds. Table 3.14-4 provides a summary of impacts by the four assessment factors.

The overall ESA effects determination in the Biological Assessment is "may affect, not likely to adversely affect" for Steller's eiders and for spectacled eiders (Owl Ridge 2017a, Appendix O). Effects determinations are made in ESA Section 7 consultation, which is a parallel process to NEPA. See Section 3.14.1, Regulatory Framework, above for further information.

See Table 3.14-7 for a comprehensive comparison of impacts to ESA-listed bird species for all alternatives. For potential effects from spills, please see Section 3.24, Spills.

Mitigation and Monitoring for Alternative 2

Effects determinations take into account impact reducing design features (Table 5.2-1 in Chapter 5, Impact Avoidance, Minimization, and Mitigation) proposed by Donlin Gold and also the Standard Permit Conditions and BMPs (Section 5.3) that would be implemented.

Design features important for reducing impacts to ESA-protected, candidate, and delisted bird species include:

- Ocean fuel barges would be double hulled and have multiple isolated compartments for transporting fuel to reduce the risk of a spill; and
- The project design includes a natural gas pipeline to decrease the amount of barging to transport diesel fuel. The design decision to use a natural gas pipeline instead of barging 110 Mgal of diesel per year was in response to community concern about barge traffic volume.

Table 3.14-4: Summary Impacts[1] of Alternative 2 on ESA-Listed Birds by Project Component

Impacts	Assessment Criteria			
	Magnitude or Intensity	Duration	Extent or Scope	Context
Mine Site: No impacts are expected because neither Steller's eiders nor spectacled eiders are known to occur in the area.				
Transportation Corridor:				
Behavioral disturbance from increased barge traffic	Changes in behavior due to project activity may not be noticeable; the two species would remain in the vicinity.	Behavior patterns for the two species may be altered for several years and would be expected to return to pre-activity levels from the end of Construction through the life of the mine, after actions causing impacts were to cease.	Impacts would be limited to vicinity of the marine transportation portion of the Project Area.	Could affect the two species listed as endangered or threatened under the ESA.
Risk of injury or mortality from collisions with barges	Any incidents of injury or mortality would be so unlikely they are undetectable; population level effects would not be detectable.	Events with potential for mortality or injury would continue for up to the life of the project.	Impacts would be limited to the vicinity of the marine transportation portion of the Project Area.	Could affect the two species listed as endangered or threatened under the ESA.
Pipeline: No impacts are expected because neither Steller's eiders nor spectacled eiders are known to occur in the area.				

Notes:

1 The expected impacts account for impact reducing design features proposed by Donlin Gold and Standard Permit Conditions and BMPs that would be required. It does not account for additional mitigation measures being considered.

Standard Permit Conditions and BMPs important for reducing impacts to ESA-protected, candidate, and delisted bird species include:

- Development and maintenance of ODPCPs, SPCC plans, and FRPs.
- Additional measures are being considered by the Corps and cooperating agencies to further minimize project impacts, as reasonable and practicable, and are further assessed in Chapter 5, Impact Avoidance, Minimization, and Mitigation (Section 5.5 and Section 5.7). No additional mitigation or monitoring measures have been identified to reduce effects to this resource.

3.14.2.2.3 ALTERNATIVE 3A – REDUCED DIESEL BARGING: LNG-POWERED HAUL TRUCKS

Alternative 3A differs from Alternative 2 in that it requires fewer ocean fuel barge trips because of the decreased use of diesel fuel. Under Alternative 3A there would be five ocean fuel barge trips during Operations (compared to 14 in Alternative 2) (Table 3.14-5). The number of river barge fuel trips would be reduced from 58 to 19 during the Operations Phase, although this is not expected to change impacts on ESA-listed bird species as no habitat exists in river barging shipping corridors upstream of Bethel.

Table 3.14-5: Estimated Annual Ocean and River Barge Traffic Under Alternative 3A

Barge	Transporting	From	To	Number of Round Trips per season	
				During Construction	During Operations
Ocean	Cargo	Seattle WA or Vancouver, B.C. area	Bethel	16	12
Ocean	Fuel	Dutch Harbor	Bethel	14	5
Total cargo and fuel barges to Bethel				**30**	**17**
River	Cargo	Bethel	Angyaruaq (Jungjuk) Port Site	50[a]	64
River	Fuel	Bethel	Angyaruaq (Jungjuk) Port Site	19[b]	19
River	Pipe and Equipment	Bethel	Staging area near Devil's Elbow, above Stony River	20 during first two years of pipeline construction	0
Total river barges, Transportation Corridor Component				**89**	**83[c]**

Notes:

Baseline barge traffic typically consists of one or two 40-ft by 160-ft barges with a pusher tug.

a Total would be 200 trips over four years. Exact distribution by year would be determined during final design.

b Average number. Actual number would range from 9 to 29 annually.

c Number represents peak years.

Source: Developed from Krall 2013, Table 2.3-34 in Chapter 2, Alternatives

Reducing the number of barge trips during the Operations Phase reduces, but does not eliminate, the potential for adverse impacts to spectacled and Steller's eiders. Alternative 3A could have direct and indirect effects on threatened or endangered birds through the ocean barge traffic. The chance of barges affecting eiders through behavioral disturbance or injury or mortality from collision with vessels would be reduced compared with Alternative 2. Impacts associated with climate change would also be the same as those discussed for Alternative 2.

3.14.2.2.4 ALTERNATIVE 3B – REDUCED DIESEL BARGING: DIESEL PIPELINE

In the Transportation Corridor, fuel barges and their potential impacts would be eliminated during the Operations Phase as there would be zero ocean barge trips compared to 14 under Alternative 2, but during the Construction Phase fuel and cargo barge activity would be the same as in Alternative 2 (Table 3.14-6). The overall chance of adverse impacts would be reduced but some risk of collision and disturbance would still exist. The number of river barge fuel trips would be reduced from 58 to no trips during the Operations Phase, although this is not expected to change impacts on ESA-listed bird species as no habitat exists in river barging shipping corridors upstream of Bethel.

The location of the pipeline corridor would remain the same as Alternative 2; however, rather than natural gas, the pipeline would carry diesel fuel. The addition of a new dock, involving pile driving, or refurbishing of an existing dock at Tyonek would not affect either eider species as they are not known to occur there. However, the shipping of diesel fuel to this location could affect Steller's eiders if a spill occurred during the winter months. Larned (2006) found Steller's eiders wintering in areas throughout both eastern and western Cook Inlet such as Ursus Cove, Bruin Bay, Kamishak Bay near Douglas R. Shoals, and Iniskin Bay, as well along the Kenai Peninsula south into Kachemak Bay. These eiders were observed in nearshore environments in protected waters generally less than 10 meters deep, which reduces the potential for them to be affected by collisions with barges that tend to be in shipping routes in deeper areas. Direct or indirect effects would be due primarily to transportation of pipe and supplies via barges during the Construction Phase; there would be the same number of ocean barge trips per year for the first year of pipeline construction (20 trips) compared to Alternative 2. There would be 12 additional ocean fuel barge trips to Tyonek during Operations compared to none in Alternative 2.

Two options to Alternative 3B have been added based on Draft EIS comments from agencies and the public:

- Port MacKenzie Option: The Port MacKenzie Option would utilize the existing Port MacKenzie facility to receive and unload diesel tankers instead of the Tyonek facility considered under Alternative 3B. A pumping station and tank farm of similar size to the Tyonek conceptual design would be provided at Port MacKenzie. A pipeline would extend northwest from Port MacKenzie, route around the Susitna Flats State Game Refuge, cross the Little Susitna and Susitna rivers, and connect with the Alternative 3B alignment at approximately MP 28. In this option, there would be no improvements to the existing Tyonek dock; a pumping station and tank farm would not be constructed near Tyonek; and the pipeline from the Tyonek tank farm considered under Alternative 3B to MP 28 would not be constructed.
- Collocated Natural Gas and Diesel Pipeline Option: The Collocated Natural Gas and Diesel Pipeline Option (Collocated Pipeline Option) would add the 14-inch-diameter natural gas pipeline proposed under Alternative 2 to Alternative 3B. Under this option, the power plant would operate primarily on natural gas instead of diesel as proposed under Alternative 3B. The diesel pipeline would deliver the diesel that would be supplied using river barges under Alternative 2 and because it would not be supplying the power plant, could be reduced to an 8-inch-diameter pipeline. The two pipelines would be constructed in a single trench that would be slightly wider than proposed under either Alternative 2 or Alternative 3B and the work space would be five feet wider. The permanent pipeline ROW would be approximately two feet wider. This option could be configured with either the Tyonek or Port MacKenzie dock options.

Table 3.14-6: Estimated Annual Ocean and River Barge Traffic Under Alternative 3B

Barge	Transporting	From	To	Number of Round Trips per season	
				During Construction	During Operations
Ocean	Cargo	Seattle WA or Vancouver, B.C. area	Bethel	16	12
Ocean	Fuel	Dutch Harbor	Bethel	14	0
Total cargo and fuel barges to Bethel				**30**	**12**
River	Cargo	Bethel	Angyaruaq (Jungjuk) Port Site	50[a]	64
River	Fuel	Bethel	Angyaruaq (Jungjuk) Port Site	19[b]	0
River	Pipe and Equipment	Bethel	Staging area near Devil's Elbow, above Stony River	20 during first two years of pipeline construction	0
Total river barges, Transportation Corridor Component				**89**	**64[c]**
Ocean	Fuel	Marine Terminals in Pacific Northwest to include Seattle, WA and/or Vancouver, B.C., or from Tesoro Refinery in Nikiski	Tyonek	0	12
Total ocean barges, Pipeline Component				**0**	**12**

Notes:

Baseline barge traffic typically consists of one or two 40-ft by 160-ft barges with a pusher tug.

a Total would be 200 trips over four years. Exact distribution by year would be determined during final design.

b Average number. Actual number would range from 9 to 29 annually.

c Number represents peak years.

Source: Michael Baker Jr. 2013a, SRK 2013a, Table 2.3-35 in Chapter 2, Alternatives

3.14.2.2.5 ALTERNATIVE 4 – BIRCH TREE CROSSING PORT

The number of ocean barge trips under Alternative 4 would be the same as under Alternative 2, therefore, the potential direct and indirect impacts to both eider species would be the same as described under Alternative 2. Impacts associated with climate change would also be the same as those discussed for Alternative 2.

3.14.2.2.6 ALTERNATIVE 5A – DRY STACK TAILINGS

This alternative includes two options:

- Unlined Option: The TSF would not be lined with an LLDPE liner. The area would be cleared and grubbed and an underdrain system placed in the major tributaries under the TSF and operating pond to intercept groundwater base flows and infiltration through the DST and convey it to a Seepage Recovery System (SRS). Water collecting in the SRS pond would be pumped to the operating pond, lower CWD, or directly to the processing plant for use in process.

- Lined Option: The DST would be underlain by a pumped overdrain layer throughout the footprint, with an impermeable LLDPE liner below. The rock underdrain and foundation preparation would be completed in the same manner as the Unlined Option.

The number of ocean barge trips under Alternative 5A would be the same as under Alternative 2, therefore the potential direct and indirect impacts to both eider species would be the same as described under Alternative 2. There would be 7 additional cargo barge trips from Bethel to Angyaruaq (Jungjuk) Port site during Operations (for a total of 129 river barges instead of 122; see Table 3.14-3), although this is not expected to change impacts on ESA-listed bird species as no habitat exists in river barging shipping corridors upstream of Bethel. Impacts associated with climate change would also be the same as those discussed for Alternative 2.

3.14.2.2.7 ALTERNATIVE 6A – MODIFIED NATURAL GAS PIPELINE ALIGNMENT: DALZELL GORGE ROUTE

The number of ocean barge trips under Alternative 6A would be the same as under Alternative 2, therefore, the potential direct and indirect impacts to both eider species would be the same as described under Alternative 2. Impacts associated with climate change would also be the same as those discussed for Alternative 2.

3.14.2.2.8 ALTERNATIVES IMPACT COMPARISON

A comparison of the impacts on listed eiders by alternative is presented in Table 3.14-7. The primary project component that could affect ESA-listed eiders is an increase in ocean barge traffic in the Transportation Corridor. Under Alternative 2, there would be 30 ocean barge trips per year (Construction Phase), and 26 ocean barge trips per year (Operations Phase). Alternatives 2, 4, 5A, and 6A all have the same number of ocean barge trips; therefore, these four alternatives would all have the same potential for impacts on listed eiders.

Under Alternative 3A, there would be 17 ocean barge trips during Operations, thus reducing the potential for impacts compared to Alternative 2.

Under Alternative 3B there would be 12 ocean barge trips to Bethel during Operations; therefore, this alternative would have the lowest potential for impacts compared to Alternative 2.

Table 3.14-7: Comparison by Alternative for ESA-Listed Birds*

	Alternative 2 – Donlin Gold's Proposed Action	Alternative 3A –LNG-Powered Haul Trucks	Alternative 3B – Diesel Pipeline	Alternative 4 – Birch Tree Crossing (BTC) Port	Alternative 5A – Dry Stack Tailings	Alternative 6A – Dalzell Gorge Route
Impact-Causing Project Components						
Increased ocean barge traffic from baseline volume	16 ocean cargo trips per year to Bethel (Construction Phase) 12 ocean cargo trips per year to Bethel (Operations Phase) 14 ocean fuel trips per year to Bethel (both Construction and Operations Phases) Totals: 30 ocean trips per year to Bethel (Construction Phase) 26 ocean trips per year to Bethel (Operations Phase)	Difference from Alternative 2: 5 ocean fuel trips per year to Bethel (Operations Phase) Totals: 17 ocean trips per year to Bethel (Operations Phase)	Difference from Alternative 2: No ocean fuel trips per year to Bethel (Operations Phase) Totals: 12 ocean trips per year to Bethel (Operations Phase)	Same as Alternative 2.	Same as Alternative 2.	Same as Alternative 2.
Direct or Indirect Impacts						
Behavioral disturbance	-Potential for behavioral disturbance exists from ocean barge trips in the Transportation Corridor. -There would be no impacts in the Mine Site or the Pipeline component as no ESA-listed bird species are known to occur there.	Compared to Alternative 2, this Alternative reduces total ocean trips in the Transportation Corridor: -from 26 trips to 17 trips (Operations Phase) -This alternative would lower the potential for behavioral disturbance in the Transportation Corridor. -There would be no impacts in the Mine Site	Compared to Alternative 2, this Alternative reduces total ocean trips in the Transportation Corridor: -from 26 trips to 12 trips (Operations Phase) -This alternative would have the lowest potential for behavioral disturbance in the Transportation Corridor. -There would be no impacts in the Mine Site	Same as Alternative 2.	Same as Alternative 2.	Same as Alternative 2.

Table 3.14-7: Comparison by Alternative for ESA-Listed Birds*

	Alternative 2 – Donlin Gold's Proposed Action	Alternative 3A –LNG-Powered Haul Trucks	Alternative 3B – Diesel Pipeline	Alternative 4 – Birch Tree Crossing (BTC) Port	Alternative 5A – Dry Stack Tailings	Alternative 6A – Dalzell Gorge Route
		or the Pipeline component as no ESA-listed bird species are known to occur there.	or the Pipeline component as no ESA-listed bird species are known to occur there.			
Risk of injury or mortality	Risk of injury or mortality exists from ocean barge trips in the Transportation Corridor. There would be no impacts in the Mine Site or the Pipeline component as no ESA-listed bird species are known to occur there.	<u>Compared to Alternative 2, this Alternative reduces total ocean trips in the Transportation Corridor:</u> -from 26 trips to 17 trips (Operations Phase) -This alternative would lower the potential for risk of injury or mortality in the Transportation Corridor. -There would be no impacts in the Mine Site or the Pipeline component as no ESA-listed bird species are known to occur there.	<u>Compared to Alternative 2, this Alternative reduces total ocean trips in the Transportation Corridor:</u> -from 26 trips to 12 trips (Operations Phase) -This alternative would have the lowest potential for risk of injury or mortality in the Transportation Corridor. -There would be no impacts in the Mine Site or the Pipeline component as no ESA-listed bird species are known to occur there.	Same as Alternative 2.	Same as Alternative 2.	Same as Alternative 2.

Notes:

*The No Action Alternative would have no new impacts on ESA-listed bird. There are no impacts at the Mine Site as these species do not occur here.

3.14.3 ESA-PROTECTED AND CANDIDATE MARINE MAMMAL SPECIES

3.14.3.1 AFFECTED ENVIRONMENT

ESA-listed marine mammals, including pinnipeds (seals, sea lions, and walruses) and cetaceans (whales, dolphins, and porpoises), occur within the proposed water-based Transportation Corridor in Kuskokwim Bay and the Kuskokwim River, in the eastern Bering Sea, and in upper Cook Inlet (Table 3.14-8). The nine ESA-protected and candidate pinniped and cetacean species found within or adjacent to the EIS Analysis Area are described in detail below.

Table 3.14-8: ESA-Protected and Candidate Marine Mammal Species or Stocks in the Project Area

Common Name	Scientific Name	Stock	Kuskokwim Bay and River	Dutch Harbor-Bethel Barge Corridor	Cook Inlet near Beluga Power Plant and Barge Landing	ESA Status
Steller sea lion	*Eumetopias jubatus*	Western	X	X	X[1]	Endangered
Bearded seal	*Erignathus barbatus nauticus*	Beringia DPS	X			Threatened
Ringed seal	*Phoca hispida*	Arctic subspecies	X			Threatened
Pacific walrus	*Odobenus rosmarus divergens*		X			Candidate
Beluga whale	*Delphinapterus leucas*	Cook Inlet			X	Endangered
Humpback whale	*Megaptera novaeangliae*	Western North Pacific and Central North Pacific		X		Endangered, Threatened[2]
Fin whale	*Balaenoptera physalus*	Northeast Pacific		X		Endangered
North Pacific right whale	*Eubalaena japonica*	Eastern North Pacific		X		Endangered
Northern sea otter	*Enhydra lutris kenyoni*	Southwest Alaska DPS		X		Threatened

Notes:

1 Steller sea lions may occasionally venture into upper Cook Inlet, but there are no terrestrial rookery or haulout sites north of Cape Douglas at the south end of Cook Inlet near Shelikof Strait (Fritz et al. 2013).

2 In 2016, NMFS divided the globally listed species into 14 DPSs, removing the species-level listing, and relisted four DPSs as endangered and one DPS as threatened. The Western North Pacific, Hawaii, and Mexico DPSs occur in the Dutch Harbor to Bethel Barge Corridor and roughly correspond to the stocks described in this section. The Western North Pacific DPS was relisted as endangered, the Mexico DPS was relisted as threatened, and the Hawaii DPS did not warrant listing.

An X denotes presence in the area.

3.14.3.1.1 STELLER SEA LIONS (*EUMETOPIAS JUBATUS*): WESTERN STOCK

The two distinct stocks of Steller sea lions in U.S. waters are the eastern stock, which ranges from California to Prince William Sound, Alaska (east of Cape Suckling at 144°W), and the western stock, which includes animals at and west of Cape Suckling to eastern Russia (Loughlin 1997). Steller sea lions in the Bering Sea and western Alaska belong to the western stock.

In November 1990, NMFS listed Steller sea lions as threatened under the ESA (55 FR 49204). In 1997, the two stocks were formally recognized (Loughlin 1997) and the western population was listed as endangered (62 FR 24345), while the eastern stock retained a threatened classification (Allen and Angliss 2013). In October 2013, NOAA delisted the eastern stock, by removing it from the ESA list of threatened and endangered species. The endangered status for the western stock remains unchanged (NMFS 2013b).

Abundance estimates derive from aerial survey counts of non-pups (adults and juveniles) and aerial and ground-based pup counts. The 2013 total abundance estimate for the western stock of Steller sea lions in Alaska was 55,422 and the minimum abundance estimate was 48,676 animals (Allen and Angliss 2015). Populations east of Samalga Pass are generally increasing, yet those to the west are decreasing (Allen and Angliss 2015).

Steller sea lions occur across the North Pacific Ocean rim from Japan to southern California and breed on rookeries in the Russian Far East, Alaska, British Columbia, Oregon and California. Both stocks occur year around in Alaska, with peak numbers in late summer, fall, and winter (Allen and Angliss 2013).

Haulouts at Cape Newenham and Round Island are the largest in northern Bristol Bay and those closest to Kuskokwim Bay and the EIS Analysis Area. Aerial surveys of the Cape Newenham Steller sea lion haulouts in 2006 yielded an average of 36 sea lions per survey during 8 surveys from January to December, with a peak count of 245 sea lions in mid-October. Steller sea lion counts at Cape Newenham are usually highest in late April to early May (MacDonald and Winfree 2008). In 2009, the high count for Steller sea lions at Cape Newenham was 136 on 15 May (Winfree 2010).

Critical habitat for Steller sea lions was designated in 1993 (58 FR 45269, August 27). This includes both aquatic and terrestrial zones. The aquatic zone in the range of the western stock includes areas within 20 nautical miles of designated rookeries and haulouts and key foraging areas in the Bogoslof district, Seguam Pass, and Shelikof Strait. Terrestrial critical habitat consists of areas landward within 3,000 feet of designated rookeries and haulouts and the air zone extends 3,000 feet above the terrestrial zone, measured vertically from sea level.

3.14.3.1.2 BEARDED SEALS (*ERIGNATHUS BARBATUS NAUTICUS*): BERINGIA DPS

The subspecies of bearded seals in the Pacific (E. b. nauticus) consists of an Okhotsk Distinct Population Segment (DPS) and a Beringia DPS. The Beringia DPS includes bearded seals in the Bering, Chukchi, Beaufort, and East Siberian seas (Cameron et al. 2010) and is the DPS of interest herein.

On December 28, 2012, NMFS issued a final determination to list the Beringia and Okhotsk DPSs of bearded seals as threatened under the ESA, with the final rule taking effect on February

26, 2013 (77 FR 76740). NMFS determined the Beringia DPS and the Okhotsk DPS are likely to become endangered throughout all or a substantial portion of their ranges in the foreseeable future, based on the likelihood of current and future sea-ice habitat modification due to climate change and marine habitat modification due to ocean acidification. On July 25, 2014, a federal court issued a decision vacating NMFS' listing of the Beringia DPS of bearded seals as threatened. NMFS appealed the court's decision to the U.S. Court of Appeals for the Ninth Circuit. On October 24, 2016, the appellate court reversed the lower court's ruling and reinstated ESA protections for the Beringia DPS of bearded seals.

Although a reliable estimate is not currently available, the total Bering Sea bearded seal population could number approximately 125,000. Their broad distribution, sea-ice habitat, and cross-political boundaries hinder accurately assessing bearded seal abundance and trends (Cameron et al. 2010). Abundance and minimum population estimates are awaiting further analysis of data collected in 2012 and 2013 (Allen and Angliss 2015).

Bearded seals are an important subsistence species for Alaska Natives (Allen and Angliss 2013). The village of Kwethluk reported harvests of 11 bearded seals in 2010 (ADF&G 2013b).

Bearded seal distribution is circumpolar and closely associated with seasonal changes in sea ice. It is unusual for bearded seals in the Bering, Beaufort, and Chukchi seas to haul out on land. Most adult bearded seals move north from the Bering Sea into the Bering Strait and Beaufort and Chukchi seas with the retreating sea ice in late April through June, then spend summer to early fall along the southern edge of the Chukchi and Beaufort Sea pack ice. Wintering and whelping bearded seals are found in coastal leads of Norton and Kotzebue Sounds, the Gulf of Karaginsky, the Gulf of Anadyr, near Point Hope, and the Bering and Chukchi seas, including Bristol and Kuskokwim bays (Coffing et al. 1998; Georgette et al. 1998). Bearded seals are occasionally seen during summer in the lower Kuskokwim River. During surveys in 2007 to 2008, one to two bearded seals were seen annually in the Tuntutuliak area between Helmick Point and Eek Island (RWJ 2008b, 2009, 2010b).

Bearded seals prey on benthic organisms, such as epifaunal and infaunal invertebrates and demersal fishes. Crabs, shrimp, and clams are major prey in the Bering, Chukchi, and Beaufort seas (Kenyon 1962; Lowry et al. 1980; Finley and Evans 1983; Antonelis et al. 1994; Dehn et al. 2007).

3.14.3.1.3 RINGED SEAL (*PHOCA HISPIDA*): ARCTIC SUBSPECIES

The Arctic ringed seal is one of five recognized subspecies of ringed seal. It is further subdivided by geographical region: Greenland Sea and Baffin Bay; Hudson Bay; Beaufort and Chukchi seas; and the White, Barents and Kara seas (Allen and Angliss 2013). Arctic ringed seals of the Beaufort and Chukchi seas are those most likely to occur in the Kuskokwim Bay region.

On December 28, 2012, NMFS issued a final determination to list the Arctic, Okhotsk, and Baltic subspecies of ringed seal as threatened, and the Ladoga subspecies as endangered under the ESA, with the final rule taking effect on February 26, 2013 (77 FR 76706). The basis for the determination was the likelihood of sea-ice habitat modification due to climate change and marine habitat modification due to ocean acidification. NMFS proposes to designate critical habitat for the Arctic ringed seal in future rulemaking.

Current reliable population abundance and trend estimates are not available (Allen and Angliss 2013). Several factors, including distribution and ecology, make population assessments difficult. A recent estimate of at least 300,000 ringed seals in the Alaskan Beaufort and Chukchi seas is considered an underestimate (Frost et al. 2004; Bengtson et al. 2005). The total population of ringed seals in the Beaufort and Chukchi seas may be closer to one million when accounting for seals inhabiting pack ice and the eastern Beaufort and Amundson Gulf areas (Frost et al. 2004; Bengtson et al. 2005). Reliable abundance and minimum population estimates are forthcoming, pending further analysis of data collected in comprehensive and synoptic aerial surveys of ice-associated seals in the Bering and Okhotsk seas in 2012 and 2013 (Allen and Angliss 2015).

Ringed seals are an important subsistence resource for Alaska Native communities (Allen and Angliss 2013). Recent harvest reports for Kwethluk show 30 ringed seals taken in 2010 (ADF&G 2013b).

Ringed seals are circumpolar and strongly ice-associated. The seasonality of ice cover dictates movements, feeding, and reproductive behavior (Kelly et al. 2010). The Arctic subspecies usually only hauls out on sea ice for resting, pupping, and molting (Kelly and Quakenbush 1990; Kelly et al. 2010). Ringed seals are found throughout the Beaufort, Chukchi, and Bering seas, including as far south as Bristol Bay in years of extensive ice coverage (Allen and Angliss 2013).

3.14.3.1.4 PACIFIC WALRUS (*ODOBENUS ROSMARUS DIVERGENS*)

The walrus is represented by two subspecies, the Atlantic walrus (O. r. rosmarus) and the Pacific walrus (O. r. divergens) (USFWS 2013a). The Pacific walrus consists of a single population that ranges throughout continental shelf waters of the Bering and Chukchi seas (Fay 1982).

Total population size is unknown. In 2006, part of the spring range in the Bering Sea pack ice was surveyed using a combination of thermal imaging and aerial photography. The resulting estimate of 129,000 walruses represents a partial and minimum population estimate, since only about half of the potential walrus habitat was surveyed (Garlich-Miller et al. 2011; Speckman et al. 2011).

In 2011, the USFWS published a notice of a 12-month finding on a petition to list the Pacific walrus as threatened or endangered under the ESA (76 FR 7634). Although considered warranted, listing was precluded by higher priority actions to list other species. Upon publication of the notice, the Pacific walrus was added to the USFWS list of candidate species. Factors considered primary threats to Pacific walrus in the foreseeable future and the reason for the determination are impacts of sea ice loss in summer and fall and the subsistence harvest.

Pacific walrus is an important subsistence species to Alaska Native communities. The average annual harvest in the U.S. for 2006-2010 was 1,782, most of which were taken in the Bering Strait region (USFWS 2013a). The Kuskokwim River communities of Akiak and Kwethluk reported harvests of one and two walrus, respectively, in 2010 (ADF&G 2013a, 2013b).

Pacific walrus distribution varies seasonally and by age and sex classes. Walruses congregate in the Bering Sea pack ice adjacent to areas with open water during the breeding season from January to March (Fay et al. 1984). Breeding aggregations are common southwest of St. Lawrence Island, south of Nunivak Island and south of the Chukotka Peninsula in the Gulf of Anadyr (Speckman et al. 2011). Adult females and juveniles and young migrate through the

Bering Strait to summer feeding areas over the continental shelf in the Chukchi Sea as Bering Sea ice breaks up in spring (Garlich-Miller et al. 2011). Most adult males remain in the Bering Sea and forage from coastal haulouts during the ice free season.

Coastal haulouts in Bristol Bay (e.g., Cape Newenham, Cape Peirce, Hagemeister Island, and Round Island) are among the most consistently used by adult males in the Bering Sea during summer. Cape Newenham, Cape Peirce, and Hagemeister Island are those nearest to Kuskokwim Bay. Walruses have been observed at Cape Peirce and Cape Newenham in northwest Bristol Bay since the early 1980s (Garlich-Miller et al. 2011). Annual peak counts of walruses on Cape Peirce declined from 1985 to 2012 (Winfree 2013). Hagemeister Island had the largest peak counts of hauled out walrus from 2005 to 2012, including more frequent and longer time periods of use. Periods of use for Cape Peirce and Hagemeister Island in 2012 were June to November and May to November, respectively. Since 2004, the peak annual haulout at Cape Peirce occurred during October-December (Winfree 2013). Summertime use of Cape Newenham by walruses has been low and irregular since the late 1990s (MacDonald and Winfree 2008). No walruses were observed at Cape Newenham from 2007 to 2012 (Winfree 2013). Peak counts in the Bristol Bay walrus haulout complex declined since 1985, while numbers using different sites varied considerably (Winfree 2013). As evidenced by tagging studies, at least some walruses moved between Bristol Bay haulout sites and Kuskokwim Bay between September and December. None occurred in Kuskokwim Bay in January (Jay and Hills 2005).

3.14.3.1.5 BELUGA WHALE (*DELPHINAPTERUS LEUCAS*): COOK INLET STOCK

The five stocks of beluga whales recognized in Alaska waters are the Beaufort Sea, eastern Chukchi Sea, eastern Bering Sea, Bristol Bay, and Cook Inlet stocks (Allen and Angliss 2013). The Cook Inlet stock is the only one listed as endangered.

The NMFS conducted aerial surveys of Cook Inlet beluga whales annually from 1993 to 2012; biennial surveys began in 2014 (Shelden et al. 2015). Population estimates, derived from aerial surveys corrected for whale sightability, showed a nearly 50 percent decline in the Cook Inlet beluga population between 1994 and 1998. Estimates ranged from a high of 653 beluga whales in 1994 to a low of 278 in 2005. The estimated abundance of 340 beluga whales in 2014 is within the range of estimates from the previous 10 survey years (312–375). The population increased since the low in 2005, yet still shows an overall declining trend. The 10-year (2004-2014) population trend is -0.4 percent and the overall trend since management of the hunt began in 1999 is -1.3 percent (Shelden et al. 2015). Despite restrictions on Alaskan Native subsistence harvest of Cook Inlet beluga whales, the population is not recovering (Hobbs and Shelden 2008).

The Cook Inlet beluga population was listed as depleted under the MMPA in 2000 and listed as endangered under the ESA in October 2008 (73 FR 62919). A recovery plan is in preparation (75 FR 4528).

Beluga whales occur in Cook Inlet year-round, but locations and movements vary seasonally. Most available information on seasonal movements is based on 14 whales outfitted with satellite transmitters in upper Cook Inlet in the summers of 2000-2002 (Hobbs et al. 2005). In general, beluga whales concentrate in river mouths or bays during summer and early fall, disperse into the middle inlet in late autumn and early winter after seasonal salmon runs at river mouths end, and disperse to pursue prey in mid- or bottom-waters farther offshore during winter (Hobbs et al. 2005). Beluga whales regularly occur in upper Cook Inlet starting in late April or early May, coincident with eulachon runs in the Susitna River and Twentymile River in Turnagain Arm. (NMFS 2008). During summer, beluga whales are found in the Susitna and Little Susitna rivers and smaller streams along the west side of the inlet, where they pursue eulachon and king salmon in the early season and coho salmon later in the summer (NMFS 2008). Traditional knowledge of beluga whales, derived from interviews with Tyonek residents, includes observed feeding at the mouths of the Beluga River, McArthur River, and Susitna River (Stephen R. Braund & Associates and Huntington Consulting 2011).

Monthly movements of tagged whales were as follows: In August, they concentrated in Knik Arm near Eagle River, along the Little Susitna River Delta, or near Fire Island, Point Possession, and the tidal estuary of Turnagain Arm. Beluga whales used Knik Arm in September, but also increased use of the Susitna Delta, Turnagain Arm, and Chickaloon Bay, and the west coast of the upper inlet to the Beluga River. In October, beluga whales spread along coastal areas as far south as Chinitna and Tuxedni bays. Use of Knik Arm, Turnagain Arm, and Chickaloon Bay continued in October. November distribution was similar to September with more widespread use of Knik Arm and Chickaloon Bay. Whales moved offshore in December and were broadly dispersed throughout the entire upper inlet through January, although with minimal use of Knik or Turnagain arms. Whales ranged most broadly in February and March, with little use of upper inlet areas and widespread use of the central offshore waters (Hobbs et al. 2005).

NMFS issued a final rule designating critical habitat for Cook Inlet beluga whales in April 2011 (76 FR 20180). The critical habitat encompasses 3,016 square miles (7,800 square km) of marine and estuarine environments considered to be essential for the survival of Cook Inlet beluga whales. Critical Habitat Area 1 includes important calving and foraging habitat where beluga whales concentrate from spring through fall. Critical Habitat Area 2 includes areas subject to less concentrated use in spring and summer, but known fall and winter use by Cook Inlet beluga whales. The boundary separating the two critical habitat areas lies between Beluga and Tyonek, with Beluga inside Critical Habitat Area 1 and Tyonek in the northern end of Critical Habitat Area 2 (Figure 3.14-4). A Critical Habitat Exclusion Area is designated in a triangle between Point MacKenzie, Cairn Point, and Ship Creek

3.14.3.1.6 HUMPBACK WHALE (*MEGAPTERA NOVAEANGLIAE*): WESTERN NORTH PACIFIC AND CENTRAL NORTH PACIFIC STOCKS

The three humpback whale stocks in the North Pacific are the California/Oregon/Washington and Mexico stock, which migrates seasonally between Central America and Mexico and California to southern British Columbia; the Central North Pacific stock, which migrates between the Hawaiian Islands and northern British Columbia/Southeast Alaska, the Gulf of Alaska, and the Bering Sea/Aleutian Islands; and the Western North Pacific stock, which migrates between Asia and Russia and the Bering Sea/Aleutian Islands (Allen and Angliss 2013). Humpback whales from the Western and Central North Pacific stocks mix somewhat on summer feeding grounds from British Columbia through the central Gulf of Alaska and into the Bering Sea. The Dutch Harbor to Bethel barge corridor traverses part of the area of overlap of these two stocks.

The abundance estimate of 19,594 humpback whales in the North Pacific (Calambokidis et al. 2008) was revised to 21,063 by Barlow et al. (2011) using capture-recapture methods and simulation models to estimate biases. Estimated abundance for the Aleutian Islands and Bering Sea ranges from 2,889 to 13,594 humpback whales. Since their ranges overlap, this estimate likely includes whales from both the western and central North Pacific stocks (Allen and Angliss 2015). Uncorrected abundance estimates of humpback whales on the eastern Bering Sea shelf during June-July 2002, 2008, and 2010 were 231, 436, and 675, respectively (Friday et al. 2013).

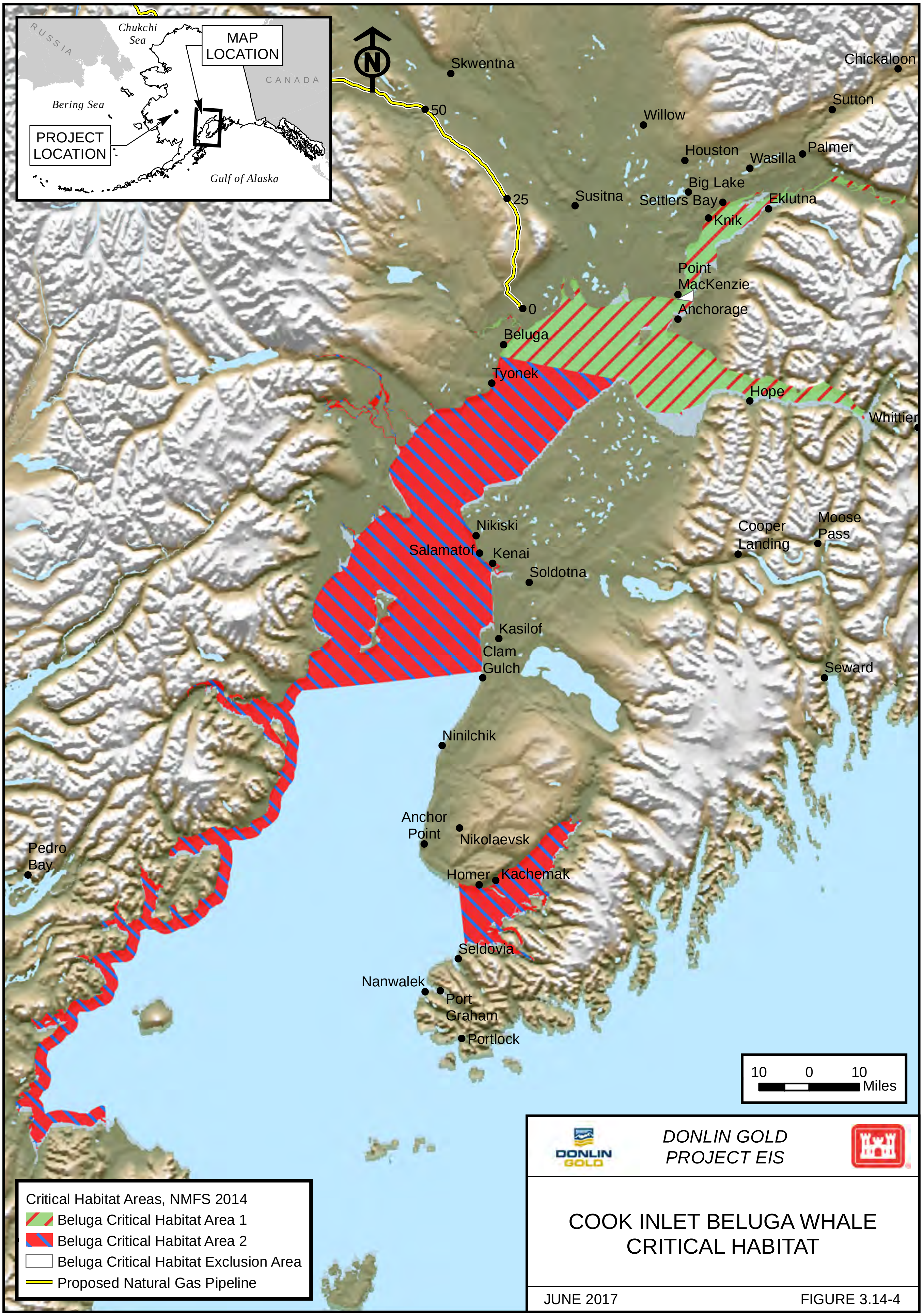
During summer, most of the central North Pacific humpback whale stock is in the Aleutian Islands, Bering Sea, Gulf of Alaska, and Southeast Alaska/northern British Columbia. High densities of humpback whales commonly occur in the eastern Aleutian Islands along the north side of Unalaska Island and along the Bering Sea shelf edge and break to the north toward the Pribilof Islands (Zerbini et al. 2006; Allen and Angliss 2013). Estimated encounter rates for humpback whales were highest in the coastal domain. Humpbacks consistently concentrate in coastal waters north of Unimak Pass and along the Alaska Peninsula in areas of nutrient upwelling and potential prey aggregation (Friday et al. 2013). Humpback whales tagged near Unalaska Bay in the summers of 2007-2010 revealed individually variable movement patterns. Some remained within 50-60 km of Unalaska Bay, while others traveled substantial distances. The variability was most likely influenced by inter-annual productivity and prey abundance (Zerbini et al. 2011).

3.14.3.1.7 FIN WHALE (*BALAENOPTERA PHYSALUS*): NORTHEAST PACIFIC STOCK

Although the International Whaling Commission recognizes a single North Pacific stock of fin whales, NMFS recognizes three stocks in U.S. Pacific waters for management purposes: Alaska (Northeast Pacific); California/ Oregon/Washington; and Hawaii (Allen and Angliss 2013). The Northeast Pacific stock is the only one that occurs in the Project Area.

There are currently no reliable abundance estimates for the entire Northeast Pacific stock of fin whales. Surveys in the Bering Sea and coastal waters from southcentral Alaska to the central Aleutian Islands provide the only data from which estimates could be derived. A provisional estimate of 5,700 fin whales west of the Kenai Peninsula is considered a minimum for this stock, since surveys only covered a small part of the entire range (Allen and Angliss 2015). Uncorrected abundance estimates of fin whales on the eastern Bering Sea shelf during June-July 2002, 2008, and 2010 were 419, 1368, and 1061, respectively (Friday et al. 2013). Zerbini et al. (2006) estimated an annual rate of increase of 4.8 percent from 1987 through 2003 for fin whales in coastal waters south of the Alaska Peninsula.

Fin whales occur throughout the North Pacific from Central Baja California to the Chukchi Sea (Nasu 1974; Rice 1974; Mizroch et al. 2009). Documented occurrence in Alaskan waters in summer and fall is primarily in the Gulf of Alaska and Bering Sea (Mizroch et al. 2009). Little is known of their migratory movements, although there is evidence of fin whales in high-latitude areas year-round (Stafford et al. 2007; Mizroch et al. 2009; NMFS 2010b). Fin whales commonly occur along frontal zones or mixing zones, corresponding with the 200 m (656 ft) isobath (Nasu 1974). In the eastern Bering Sea, fin whales are broadly distributed in the outer domain and slope (Friday et al. 2013). Primary prey of fin whales in the North Pacific includes euphausiids (krill), large copepods, and schooling fish such as herring, walleye pollock, and capelin (Nemoto 1970; Kawamura 1982).



DONLIN GOLD PROJECT EIS

COOK INLET BELUGA WHALE CRITICAL HABITAT

JUNE 2017

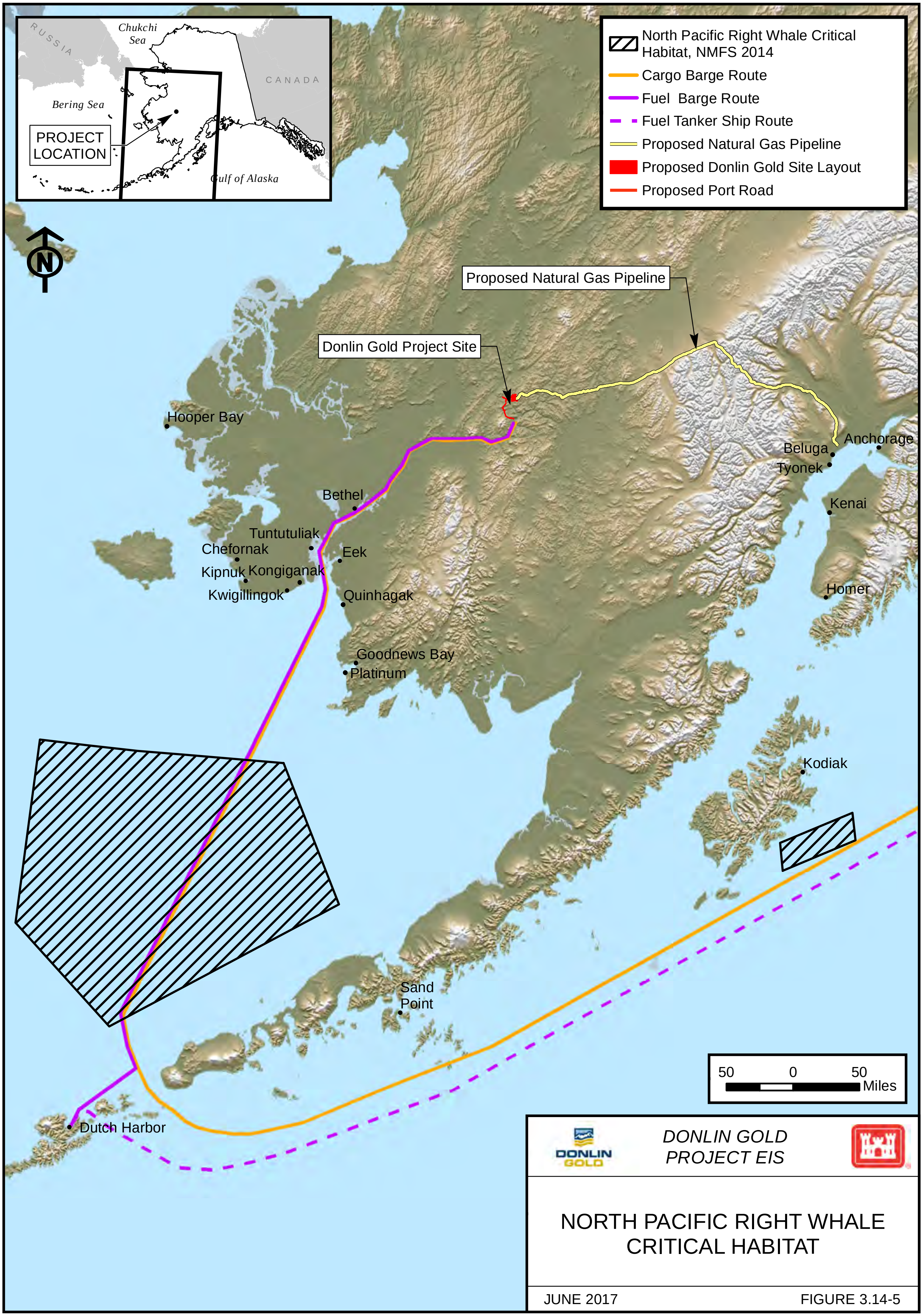
FIGURE 3.14-4

3.14.3.1.8 NORTH PACIFIC RIGHT WHALE (*EUBALAENA JAPONICA*): EASTERN NORTH PACIFIC STOCK

The North Pacific right whale is critically endangered due to heavy exploitation from 19th century commercial whaling and illegal Soviet whaling in the 1960s. It is considered one of the rarest and most endangered large whales in the world (Allen and Angliss 2013; NMFS 2013c). Recent genetic analyses show lack of genetic diversity, an extremely low effective population size, and apparent isolation of eastern and western Pacific populations, indicating that right whales are in serious danger of immediate extirpation from the eastern North Pacific (LeDuc et al. 2012). The species is exceedingly rare and is the world's smallest whale population for which a population estimate exists (Wade et al. 2011). Using photo-identification and genetic mark-recapture techniques, 31 and 28 individuals, respectively, were estimated to occur in the Bering Sea and Aleutian Islands. Although this may represent a Bering Sea sub-population, available data indicate that the entire eastern North Pacific population is likely not much larger (Wade et al. 2011).

Recent sightings, satellite telemetry, and acoustic detections confirm that the southeastern Bering Sea is an important area for right whales from late spring to late fall (Shelden et al. 2005; Munger et al. 2008; Baumgartner et al. 2013; Zerbini et al. 2015). Although occasionally seen and acoustically detected elsewhere, the southeast Bering Sea is the only area where right whales have been seen consistently since the 1980s (Shelden et al. 2005). Long-term monitoring of calls show right whales intermittently occur on the southeast Bering Sea middle shelf between May and December, with frequency and duration of occurrence greatest in July–October. Right whales may also occasionally occur over the Bering Sea slope (Munger et al. 2008). All sightings in the Bering Sea since 1996 have been on the southeastern Bering Sea shelf (Wade et al. 2011). The availability of the copepod, *Calanus marshallae*, the primary prey of North Pacific right whales on the southeastern Bering Sea shelf during the summer, is the main reason North Pacific right whales return annually to the area (Baumgartner et al. 2013).

In July 2006, NMFS published a final rule designating critical habitat for the northern right whale in the Gulf of Alaska and the southeastern Bering Sea, which comprises approximately 95,200 square km of marine habitat (71 FR 38277). When the North Pacific right whale was listed as a separate, endangered species in 2008, the two areas previously designated as critical habitat for the northern right whale were redesignated as critical habitat for the North Pacific right whale (73 FR 19000) (Figure 3.14-5). Satellite telemetry studies conducted in 2004, 2008 and 2009 show that the tagged whales remained within the Critical Habitat in the Bering Sea, providing further evidence that the Critical Habitat encompasses important range of the population during the feeding season (Zerbini et al. 2015). Analysis of sonobuoy recordings from the summers of 2008-2011 revealed a high level of site fidelity in the northeastern part of the Critical Habitat. Long-term acoustic recorders located across the Bering Sea shelf also confirm this site fidelity within the northeastern Critical Habitat, with seasonal presence extending from July through January (Clapham et al. 2012). The proposed Dutch Harbor to Bethel barge corridor traverses the designated Critical Habitat in the Bering Sea.



DONLIN GOLD
PROJECT EIS

NORTH PACIFIC RIGHT WHALE CRITICAL HABITAT

JUNE 2017

FIGURE 3.14-5

3.14.3.1.9 NORTHERN SEA OTTER (*ENHYDRA LUTRIS KENYONI*): SOUTHWEST ALASKA DPS

Three genetically and geographically distinct population segments (DPSs) of sea otters occur in Alaska: the Southwest Alaska DPS, which ranges from the Bering Sea, Aleutian Islands, and Alaska Peninsula to the western shore of Cook Inlet; the Southcentral Alaska DPS, which ranges from Cook Inlet east to Cape Yakataga; and the Southeast Alaska DPS, which extends from Cape Yakataga to the southern boundary of Alaska (Gorbics and Bodkin 2001). Only the Southwest Alaska DPS occurs in the Project Area, specifically, in the Unalaska Island (Dutch Harbor) portion of the Transportation Corridor. It is also the only DPS in Alaska listed under the ESA.

Sea otter populations in southwest Alaska declined by more than 50 percent since the mid-1980s, and there is no evidence of recovery. Despite this, the overall population trend for the Southwest Alaska DPS appears to have stabilized (USFWS 2014b). The most recent survey of the Aleutian Islands occurred in 2000 and resulted in an adjusted estimate of 8,742 sea otters (Doroff et al. 2003). Aerial survey counts of sea otters on Unalaska and Sedanka Islands were 554 and 374 in 1992 and 2000, respectively (Doroff et al. 2003). The adjusted estimate for entire range from Kamishak Bay to the Aleutian Islands is 54,771 (USFWS 2014b).

The USFWS published the final rule designating critical habitat for the Southwest Alaska DPS in 2009 (74 FR 51988). Primary defining features of critical habitat are: shallow, rocky areas where marine predators are not likely to forage; nearshore waters within 100 m (328.1 feet) of the mean high tide line that may provide protection from marine predators; kelp forests that provide marine predator protection; and adequate prey availability and quality. The five management units designated as critical habitat are: Western Aleutian Unit; Eastern Aleutian Unit; South Alaska Peninsula Unit; Bristol Bay Unit; and Kodiak, Kamishak, Alaska Peninsula Unit.

3.14.3.1.10 CLIMATE CHANGE

Climate change is affecting resources in the EIS Analysis Area and trends associated with climate change are projected to continue into the future. Section 3.26.3 discusses climate change trends and impacts to key resources in the physical and biological environments including atmosphere, water resources, permafrost, and vegetation. Current and future effects on marine mammals are tied to changes in physical resources (discussed in Section 3.26.4, Climate Change).

3.14.3.2 ENVIRONMENTAL CONSEQUENCES

This section describes potential impacts to ESA-listed bird species as a result of the project. Table 3.14-9 provides the impact methodology framework applied to assessing direct or indirect impacts to ESA-listed birds based on four factors of intensity (magnitude), duration, extent, and context (40 CFR 1508.27, described in Section 3.0, Approach and Methodology).

ESA Section 7 Consultation conclusions, as a separate process but parallel process to NEPA, are summarized in the Summary of Alternative 2 section below, and described fully in the Biological Assessment (Owl Ridge 2017b, Appendix O).

Table 3.14-9: Impact Methodology for Effects on ESA-Listed Marine Mammals

Type of Effect	Impact Factor	Assessment Criteria		
Behavioral Disturbance	Magnitude or Intensity	Changes in behavior due to project activity may not be noticeable; animals remain in the vicinity.	Noticeable change in behavior due to project activity that may affect reproduction or survival of individuals.	Acute or obvious/abrupt change in behavior due to project activity; life functions are disrupted; animal populations are reduced in the EIS Analysis Area.
	Duration	Behavior patterns altered infrequently, but not longer than the span of the Construction Phase and would be expected to return to pre-activity levels after actions causing impacts were to cease.	Behavior patterns altered for several years and would return to pre-activity levels in the long-term (from the end of the Construction Phase through the life of the mine) after actions causing impacts were to cease.	Change in behavior patterns would continue even if actions that caused the impacts were to cease; behavior not expected to return to previous patterns.
	Extent or Scope	Impacts limited to vicinity of the Project Area.	Potentially affects resources throughout the EIS Analysis Area.	Affects populations distant from the Project Area.
	Context	Affects usual or ordinary resources in the EIS Analysis Area; resource is not depleted in the locality or protected by legislation.	Affects depleted species within the locality or region, or resources proposed as candidates or listed as threatened under the ESA but whose populations are currently stable, or the portion affected is not a large percentage of the population.	Affects species listed as endangered under the ESA, or those listed as threatened or proposed for listing under the ESA with small or declining populations.
Injury and Mortality	Magnitude or Intensity	No noticeable incidents of injury or mortality; population level effects not detectable.	Incidents of injury or mortality are detectable; populations remain within normal variation.	Incidents of mortality or injury create population-level effects.
	Duration	Events with potential for mortality or injury would occur for a brief, discrete period lasting less than one year, or up to the duration of the construction period.	Events with potential for mortality or injury would continue for up to the life of the project.	Potential for mortality or injury would persist after actions that caused the disturbance ceased.
	Extent or Scope	Impacts limited to vicinity of the Project Area.	Potentially affects resources throughout the EIS Analysis Area.	Affects populations distant from the Project Area.

Table 3.14-9: Impact Methodology for Effects on ESA-Listed Marine Mammals

Type of Effect	Impact Factor	Assessment Criteria		
	Context	Affects usual or ordinary resources in the EIS Analysis Area; resource is not depleted in the locality or protected by legislation.	Affects depleted species within the locality or region, or resources proposed as candidates or listed as threatened under the ESA but whose populations are currently stable, or the portion affected is not a large percentage of the population.	Affects species listed as endangered under the ESA, or those listed as or threatened or proposed for listing under the ESA with small or declining populations.
Habitat Alterations[1]	Magnitude or Intensity	Changes in resource character or quantity may not be measurable or noticeable.	Noticeable changes in resource character and quantity.	Acute or obvious changes in resource character and quantity.
	Duration	Resource would be reduced infrequently but not longer than the span of 1 year and would be expected to return soon to pre-activity levels.	Resource would be reduced for up to the life of the project in the long-term (from the end of construction through the life of the mine years).	Resource would not be anticipated to return to previous character or levels.
	Extent or Scope	Impacts limited to vicinity of the Project Area.	Potentially affects resources throughout the EIS Analysis Area.	Affects populations distant from the Project Area.
	Context	Affects usual or ordinary habitat in the EIS Analysis Area; habitat is not depleted in the locality or protected by legislation.	Affects depleted habitat within the locality or region or habitat protected by legislation.	Affects habitat protected by ESA legislation, such as designated critical habitat.

Notes:

1 Habitat alteration impacts are habitat changes and/or injury or mortality through contamination from fuel or chemical spills, discussed in Section 3.24, Spills.

3.14.3.2.1 ALTERNATIVE 1 – NO ACTION

Under the No Action Alternative, there would be no Mine Site development, no Transportation Corridor, and no Pipeline. There would, therefore, be no project-related impacts to threatened or endangered marine mammals in the Project Area.

3.14.3.2.2 ALTERNATIVE 2 – DONLIN GOLD'S PROPOSED ACTION

The following is a general description of the sources or mechanisms of potential impacts to ESA-listed marine mammal species. Details, such as behavior patterns and habitat, are described below under each project component.

For each type of impact, the design features that would mitigate or reduce the impact are also described. The impacts assessed under each alternative are those that remain following implementation of the design features detailed in Chapter 2. Specific mitigation measures that agencies are considering to further reduce impacts, as reasonable and practicable, are also discussed in Chapter 5, Impact Avoidance, Minimization, and Mitigation, along with an evaluation of their expected effectiveness.

Based on comments on the Draft EIS from agencies and the public, one route option has been included in Alternative 2 to address concerns due to pipeline crossings of the Iditarod National Historic Trail (INHT):

- North Option: The MP 84.8 to 112 North Option would realign this segment of the natural gas pipeline crossing to the north of the INHT before the Happy River crossing and remain on the north side of the Happy River Valley before rejoining the alignment near MP-112 where it enters the Three Mile Valley. The North Option alignment would be 26.5 miles in length, compared to the 27.2 mile length of the mainline Alternative 2 alignment it would replace, with one crossing of the INHT and only 0.1 mile that would be physically located in the INHT right-of-way (ROW). The average separation distance from the INHT would be 1 mile.

Mine Site – All Phases

Any direct or indirect effects on threatened or endangered marine mammals incurred during the Construction, Operations, or Closure phases of the Mine Site would be due to transportation of fuel and materials via barges or construction at the port sites. These are discussed below under Transportation Corridor. There would, therefore, be no direct or indirect effects of the Mine Site component of Alternative 2 on ESA-protected marine mammals.

Transportation Corridor

The marine and riverine portions of the Transportation Corridor and barging and nearshore activity in upper Cook Inlet are the project components most likely to impact threatened or endangered marine mammals. Potential direct and indirect effects include:

- Behavioral disturbance or displacement from increased barge traffic due to noise; and
- Injury or mortality from collisions with barges (vessel strikes);
- Habitat changes and/or injury or mortality through contamination from fuel or chemical spills (addressed in Section 3.24, Spill Risk).

These impacts are described in further detail below under associated subheadings. Impacts specific to each project phase are described in individual sections below.

Effects of barge trips south of Dutch Harbor or Cook Inlet are not analyzed because they are a small fraction of the typical shipping traffic to and from the Dutch Harbor vicinity and are within the range of variability of that shipping background.

As described in above in Section 3.14.1, Section 7 of the ESA requires all federal agencies to consult with the USFWS and/or NMFS when any action undertaken, funded, or permitted through the agency may affect an ESA-listed species or critical habitat. If the proposed action may affect listed species, the agency may prepare a Biological Assessment, or accept an applicant-prepared one, to aid in determining the project’s effects on listed species. The Corps approved Biological Assessments for submission to the USFWS and NMFS for review; these are included in this document in Appendix O.

The context of all potential direct and indirect impacts to the nine species discussed are that they are ESA-protected or candidate pinniped and cetacean species found within or adjacent to the EIS Analysis Area. Effects determinations in the Biological Assessment for ESA-listed marine mammal species included within the scope of the EIS Analysis Area may be "no effect," "may affect, but not likely to adversely affect," or "may affect, and is likely to adversely affect." The action area of the Biological Assessment includes the barge corridor from Dutch Harbor, Alaska, to Bethel, Alaska (Owl Ridge 2017b, Appendix O). See Section 3.14.1, Regulatory Framework, above for further information.

Behavioral Disturbance

The three types of potential impacts of noise on marine mammals are non-auditory injury, auditory injury, and behavioral (e.g., avoidance, changes in foraging or social behavior) (Richardson et al. 1995; Southall et al. 2007). NMFS developed acoustic criteria that estimate at what received sound levels these impacts would occur from different types of sounds. NMFS currently uses a sound threshold of 160 decibels referenced to 1 micro Pascal (dB re 1 µPa rms) for impulsive noises and 120 dB re 1 µPa rms for continuous, non-impulsive sounds to determine the onset of behavioral harassment for marine mammals (70 FR 1871). Impulsive sounds are transient, brief (less than one second), broadband, and typically rise and decay rapidly. Non-impulsive sounds can be broadband, narrowband, tonal, brief or prolonged, continuous or intermittent, and generally lack the high peak pressure and rapid rise time of impulsive sounds (NOAA 2016). Currently used acoustic thresholds for received sound levels above which hearing impairment or other injury could potentially occur are 180 and 190 dB re 1 µPa (rms) for cetaceans and pinnipeds, respectively (NOAA 2016).

Behavioral impacts on marine mammals from vessel traffic noise and dock and port construction noise are the noise-related impacts most likely to occur. In-water noise from vessels, sonar, construction, or other sources could interfere with, or mask, marine mammal communication or cause deflection from or avoidance of an area (Würsig et al. 2000; David 2006; Clark et al. 2009; Tougaard et al. 2009; Norman 2011). Communication masking by ship noise is difficult to quantify, but studies off the coast of New England suggest that masking effects in high traffic areas are more severe for right whales than for singing fin or humpback whales, since right whale calls are not as loud as fin and humpback songs (Clark et al. 2009). Under moderate noise levels, North Atlantic right whales increase call amplitude coincident to increasing background noise levels (Parks et al. 2010). In addition, there is evidence that exposure to low-frequency ship noise induces chronic stress in North Atlantic right whales (Rolland et al. 2012). Direct injury from noise is not likely, as sound levels are all expected to be well below injury thresholds.

Marine mammals have variable reactions to vessel activity and noise. Whales react less dramatically to the noise from slow-moving vessels than to faster and/or erratic vessel movements and engine noises. Some species tolerate slow-moving vessels within several hundred yards, especially if there are no sudden changes in direction or engine speed (Wartzok et al. 1989; Richardson et al. 1995; Heide-Jorgensen et al. 2003). Behavioral responses to vessels vary by vessel size, speed, distance, and whale species, but may include avoidance, such as swimming away from the vessel, or changes in diving and surfacing behavior (Finley et al. 1990;

Norman 2011). Pinnipeds are sensitive both to sound in air and in water and may be susceptible to loud noise when they are in the water or hauled out on land (Kastak et al. 2005). Reactions of walrus in the water to passing vessels in the Chukchi Sea ranged from none to swimming away (Haley et al. 2010).

Most available information on reactions of pinnipeds to boats concern pinnipeds hauled out on land or ice. Human-caused disturbances of hauled-out seals usually result in flushing animals into the water (Suryan and Harvey 1999; Jansen et al. 2006). The amount of time before haulout behavior returns to pre-disturbance levels varies (Kucey 2005). In places where boat traffic is heavy, seals may habituate to vessel disturbance (Bonner 1982; Jansen et al. 2006). Few data exist on hearing in sea otters. Auditory measurements obtained from a single captive sea otter reveal that in air (above water) hearing was similar to sea lions, but underwater hearing sensitivity was significantly lower than that of sea lions and other pinnipeds, especially at low frequencies (Ghoul and Reichmuth 2014). Since sea otter hearing appears primarily adapted to airborne sounds, they are more likely to be affected by above water, rather than underwater disturbances, such as engine noise. There have been few studies of the behavioral responses of sea otters to disturbance by boats although anecdotal evidence suggests reactions range from diving to moving away from the disturbance to habituation (USFWS 2013b). The only portion of the barge corridor where sea otters may be encountered is in the vicinity of Dutch Harbor, an area of already frequent and regular vessel traffic to which sea otters are likely accustomed and unlikely to experience disturbance from additional barge traffic. The rare occurrence of threatened and endangered marine mammals and the absence of major pinniped haulout sites in the Kuskokwim River and mouth of the river suggest minimal likelihood of disturbance from vessel noise in that part of the Transportation Corridor. Intermittent, temporary behavioral disturbance of fin, humpback, or right whales could periodically occur through the life of the project along the Dutch Harbor to Bethel barge corridor during the ice-free shipping season in areas where the species coincide with the shipping route. However, this would not result in permanent behavior patterns after barge trips ceased.

North Pacific right whales could be affected by barge noise as the route bisects the Bering Sea critical habitat during the summer season. The primary concern is the potential for masking of whale communication, and displacement of feeding whales. Analysis of the potential for encounters shows that even if the entire North Pacific right whale population of 30 right whales is within the critical habitat area during a barge crossing, the expected encounter rate is low due to the low density of whales within the 35,780-mi^2 area. Because the eastern Pacific population of this species is critically low (approximately 30 animals), any effect on the population can have great consequences on the long-term survival of the species. Intermittent, temporary behavioral disturbance of North Pacific right whales could periodically occur through the life of the project along the Dutch Harbor to Bethel barge corridor during the ice-free shipping season in areas where the species coincide with the shipping route. However, this would not result in permanent behavior patterns after barge trips ceased. Any actions that would occur at Dutch Harbor or the Port of Bethel at the Bethel Yard Dock are not part of the proposed action, and are considered connected actions (see Section 1.2.1, Connected Actions, in Chapter 1, Project Introduction and Purpose and Need).

Injury or Mortality from Collisions (Vessel Strikes)

Marine mammal-ship collisions occur worldwide, with effects ranging from survivable lacerations to serious injury or mortality from propeller cuts to blunt force trauma. Vessel speed is a key determinant of the frequency and severity of ship strikes. The potential for collisions with marine mammals increases with ships traveling at speeds of 15 knots and greater (Laist et al. 2001; Vanderlaan and Taggart 2007). The potential for vessel strikes in the Kuskokwim River and at the mouth of the river would be minimized by the relatively slow speed at which tugs and barges are expected to travel in that portion of the Project Area. River barges for cargo travelling to or from the Bethel Port are expected to average 4 knots upriver while loaded and 10 knots downriver when empty. Similarly, the average speed of fuel barges would be 3.5 knots while loaded travelling upriver and 10 knots downriver and empty. The transit speed of the fuel and cargo tugs and barges travelling between Dutch Harbor and the mouth of the Kuskokwim River should be in the 10 knot (or slower) range and, thus, below the speed threshold above which the potential for and severity of collisions increase. They may still be of concern for slower moving species such as the North Pacific right whale. The barge corridor traverses designated Bering Sea critical habitat (see Table 3.14-3 for numbers of estimated annual ocean barge traffic under Alternative 2).

Telemetry and acoustic studies indicate that tagged right whales showed a high level of site fidelity to the northeast portion of this area for feeding during summer months (Clapham et al. 2012; Zerbini et al. 2015), which includes the area through which the barge corridor passes. Although the designated critical habitat encompasses the area of recent historical use by right whales, distribution tends to be clustered and influenced by prey availability and not evenly spread across the critical habitat. Collisions with vessels are considered a potential threat to North Pacific right whales (NMFS 2013c). Available evidence suggests that impacts of ships on North Pacific right whales are currently low. This may be due to limited vessel activity in North Pacific right whale habitat or low detectability of collisions due to little to no observer coverage and an offshore distribution of North Pacific right whales (NMFS 2013c). Conn and Silber (2013) modeled mortality risk of North Atlantic right whales following the 2008 mandatory time-area vessel speed restrictions along the U.S. eastern seaboard instituted by NOAA in an effort to mediate collision-related mortality of right whales. All vessels 65 feet and greater in length were restricted to speeds of 10 knots or less during seasonally implemented regulatory periods. The risk was modeled both when the vessel restrictions were in effect and were not in effect. The results indicated a significant positive relationship between ship speed and the probability of a lethal injury. Conn and Silber (2013) estimated that vessel speed restrictions reduced total ship strike mortality risk levels by 80–90% indicating that vessel speed limits are a powerful tool for reducing anthropogenic mortality risk for North Atlantic right whales.

Humpback whales and fin whales are also known to be susceptible to ship strikes, including by large, ocean-going vessels (Jensen and Silber 2003). There have, thus far, been no reported whale-vessel collisions in the Bering Sea or Kuskokwim River portions of the EIS Analysis Area (Neilson et al. 2012).

Vessel strikes are rarely observed in pinnipeds in the EIS Analysis Area, so not considered likely impacts. Vessel strikes are a known cause of death in all three stocks of northern sea otters, but in most cases, contributing factors (e.g., disease, biotoxin exposure) incapacitated the animal, leaving it vulnerable to ship strike (USFWS 2014b).

Contamination and Fuel Spills

Marine mammals could potentially be exposed to discharges and varying sized spills from vessels transporting fuel and cargo, as well as to fuel spilled at any of several transfer points, including barge to storage tank transfer, or ocean barge to river barge transfer, at the Bethel Port site, and river barge to storage tank transfer at the Angyaruaq (Jungjuk) Port site, or in the event of a stranded barge that requires lightering of fuel.

Section 3.24, Spill Risk, provides analysis of risks and potential impacts of spills from fuel barges and storage tanks along the marine and riverine Transportation Corridor, including Dutch Harbor, and from tanker trucks traveling to and from the mine. Refer to Sections 3.24.6.12.2 and 3.24.6.14.2 for details regarding health effects of hydrocarbon exposure and potential impacts of the different spill scenarios on threatened, endangered, and candidate marine mammals in the EIS Analysis Area. The risk of catastrophic accidents is very small (likelihood of occurrence is very low during the life of the Project), although small accidents and spills could periodically occur. The severity of impacts would depend on the type of contaminant spilled, the volume and extent of the spill, time and location of a spill, and whether or not threatened or endangered marine mammals are present.

Construction Phase

Two components to consider are construction of specific facilities for the Transportation Corridor (i.e., at the Bethel Port Site, fuel terminal, and tank farm [connected action]; and the Angyaruaq [Jungjuk] Port site); and shipping and offloading cargo and fuel during construction of the Mine Site and Pipeline. Several mechanisms for effects are noted above. Any actions that would occur at Dutch Harbor or the Port of Bethel at the Bethel Yard Dock are not part of the proposed action, and are considered connected actions (see Section 1.2.1, Connected Actions, in Chapter 1, Project Introduction and Purpose and Need).

Dock construction at the port sites would involve pile driving. The high amplitude noise from pile driving activities may mask marine mammal vocalizations or cause deflection or avoidance of an area (Würsig et al. 2000; David 2006; Tougaard et al. 2009). Studies of large-scale offshore pile driving suggest audibility depends on propagation conditions and background noise, but could be at great distances from the sound source (Kastelein et al. 2013). Noise could result in some temporary displacement or avoidance of the area by marine mammals during pile driving activities (Kendall 2010; Dahne et al. 2013). In areas of more regular or consistent construction activity, ringed seals showed levels of tolerance suggestive of habituation (Blackwell et al. 2004). The frequency of occurrence of threatened and endangered pinnipeds in the area of the Bethel and Jungjuk (Angyaruaq) port sites is, however, extremely uncommon, limiting the likelihood that individuals would be adversely affected by construction noise.

During the Construction Phase, supplies would be transported by ocean-going and river barges during the 110-day ice-free shipping season from approximately June 1 to October 1. Cargo barges would make 16 round trips to Bethel within the shipping season during the Construction Phase. Cargo would then either be temporarily stored or transferred to river barges for shipment from Bethel to the Angyaruaq (Jungjuk) Port site. A larger flat deck barge would transport break-bulk and cargo too heavy for the barges, such as equipment. The river cargo barge fleet, comprised of two single-hull pusher tugs with four river barges each, would operate daily during the shipping season, for a total of 50 trips per year. The river fuel barge fleet would make 19 trips annually during construction. Additionally, there would be 20 river barge trips with pipeline related pipe and equipment annually during the first two years of pipeline construction.

Potential effects on Steller sea lions, bearded and ringed seals, and walruses could include temporary displacement during the Construction Phase at the Bethel Port site (if present) and behavioral disturbance or displacement caused by vessel traffic delivering fuel and cargo to Bethel and upriver to the Angyaruaq (Jungjuk) Port site, in terms of duration. Since the nearest walrus and sea lion haulouts are in northern Bristol Bay and outside of the Project Area, large scale disturbance of sensitive habitat and life stages is unlikely. Bearded seals in the lower Kuskokwim River are rare (1-2 per year) and the other species may infrequently occur in Kuskokwim Bay, but are unlikely in the river. Given these infrequent sightings, any impacts on threatened and endangered pinnipeds due to construction activities in the Kuskokwim River would be localized in areas where activities and animals may co-occur in terms of extent or scope. In an impacts context, the western stock of Steller sea lions is listed as endangered. The other pinnipeds are either listed as threatened or as candidates for threatened listing. There have been no reports of ESA-protected cetaceans in the Kuskokwim River, so they would not be affected by construction activities at the Bethel and Angyaruaq (Jungjuk) Port sites. Any actions that would occur at Dutch Harbor or the Port of Bethel at the Bethel Yard Dock are not part of the proposed action, and are considered connected actions (see Section 1.2.1, Connected Actions, in Chapter 1, Project Introduction and Purpose and Need).

Fin whales, humpback whales, and right whales could experience periodic behavioral disturbance (e.g., avoidance) over the life of the project from passing cargo barges transporting construction materials from Dutch Harbor to Bethel during the ice free shipping season' in terms of duration and extent of impacts. Injury or mortality from a vessel collision in the barge corridor is unlikely with only 30 ocean barge round trips per 110 day shipping season during the Construction Phase in terms of intensity of impact. Most whales are likely to move out of the way of an oncoming vessel. However, given the exceedingly small North Pacific right whale population size (about 30 individuals), injury to or mortality of even one individual would have population level effects. As a result, although the likelihood of occurrence might be low and the duration of the activity would be temporary during the Construction Phase, if a vessel collision with a right whale occurred, it would be considered a serious impact to the population in terms of intensity. In terms of context, all three species are listed as endangered under the ESA.

Operations Phase

Shipping activity during the Operations Phase would occur during the ice-free season from about June 1 to October 1. The number of vessels and frequency of operation would differ slightly from that during Construction, but the potential effects would be similar. Several mechanisms for effects are noted above. Details specific to Operations are noted here.

During the estimated 110-day shipping season, ocean cargo barges would complete 12 round trips between marine terminals and the Bethel Port site (see Table 3.14-3 for numbers of estimated annual ocean barge traffic under Alternative 2). In addition, fuel would be transported from Dutch Harbor to Bethel in an ocean barge towed by a 3,000 horsepower tug and off-loaded at the tank farm for storage or to a river barge for transport. There would be 14 such fuel delivery trips per season. Total combined fuel and cargo ocean barge trips to Bethel Port site would be 26 per season.

The river barges for cargo are expected to make 64 round trips (one tug and four barges) per season between the Bethel and Angyaruaq (Jungjuk) Port sites. River fuel barges are anticipated to make 58 fuel round trips between Bethel and Angyaruaq (Jungjuk). Total combined fuel and cargo river barge trips between the Bethel Port site and the Angyaruaq (Jungjuk) Port site on the Kuskokwim River would be 122 round trips per 110-day season, an increase from the current baseline of 68 barge trips per year.

This increased barge traffic in the Kuskokwim River would increase underwater noise levels and the potential for behavioral disturbance of individual marine mammals in the area, such as temporary disturbance or displacement as the tugs and barges pass by during the ice-free season over the life of the project, in terms of duration. Threatened and endangered pinnipeds are rare in the lower Kuskokwim River (one to two sightings of bearded seals per year, 2007-2009) minimizing the likelihood of repeated co-occurrence with barge traffic, in terms of intensity. Given the slow speed at which the barges would travel, plus engine noise, marine mammals would likely anticipate approaching vessels with adequate time to move out of harm's way and avoid collisions. In terms of intensity, the total number of barge trips between Dutch Harbor and Bethel would be higher during Construction than during Operation (see Table 3.14-3 for numbers of estimated annual ocean barge traffic under Alternative 2), but the potential impacts on marine mammals in the Dutch Harbor to Bethel barge corridor would be as described above for the Construction Phase. North Pacific right whales are, again, the species of greatest concern in this region of the EIS Analysis Area, in terms of extent or scope, particularly as the duration of project-related activities with the potential to cause injury or mortality would occur during the entire Operations Phase (as barge traffic continues for the life of the project).

Closure Phase

Direct and indirect effects would likely be similar to effects described above for the Construction and Operations Phases, and be largely attributed to transportation of fuel and materials via barges in the Kuskokwim River and mouth of the river, and dismantling of the barge landing at the Angyaruaq (Jungjuk) Port site. In terms of intensity, noise generated during removal of the barge landing would likely be of lower amplitude than during dock construction and of shorter duration. The number and frequency of barge trips hauling materials down river would also be lower than during either Construction or Operations, although a quantified number is not available. Potential effects from vessel traffic and material and fuel transport are as discussed above. With the lower activity level and shorter time period, potential effects on threatened and endangered marine mammals would likely include behavioral disturbance would be temporary in duration and limited to areas of reclamation and points along the river where barges and seals may occasionally co-occur, in terms of extent or scope.

Pipeline - All Phases

Direct or indirect effects would be due primarily to transportation of pipe and supplies via barges during the Construction Phase; there would be 20 ocean barges during the first year of pipeline construction from Anchorage to Beluga Landing (see Table 3.14-3). Potential effects from ocean barges are, therefore, similar in type to those discussed above for the Transportation Corridor. Cook Inlet beluga whales are common in upper Cook Inlet, including in the vicinity of the Beluga River and Beluga barge landing. They are, therefore, the ESA-listed species most likely to be affected by vessel activity associated with the Pipeline component construction, in terms of intensity of impact. Behavioral disturbance and temporary avoidance are possible as the barge route traverses Cook Inlet Beluga Designated Critical Habitat Area 1 during the time that it is actively used.

Alaska Native beluga whale hunters noted that Cook Inlet beluga whales are very sensitive to boat noise and will leave areas of high vessel use. Small outboard motors that produce higher frequency sounds have the greatest potential to disturb beluga whales. In some heavily trafficked areas, such as in the Port of Anchorage, beluga whales may habituate to the noise (Norman 2011). Potential effects, however, depend on vessel routes, frequency, seasonality, and vessel size and speed, and may include disruption of feeding activities, temporary avoidance or displacement. The anticipated vessel noise produced by the barging activity would exceed the established 120 dB behavioral harassment threshold criteria for continuous sounds within 10 miles of the Beluga River, but would diminish to below ambient levels prior to reaching the area of beluga whale concentrations (see Appendix O, Biological Assessments, for a detailed description of harassment threshold criteria). In Cook Inlet, ship strikes from large vessels (those over 30 m length, such as barges and tankers) are not considered a major threat to beluga whales. These large ships generally travel in relatively straight lines and at slower speeds, enabling beluga whales to avoid them more readily (Norman 2011). Injury or mortality of Cook Inlet beluga whales from vessel traffic associated with the Pipeline Construction is, therefore, considered unlikely.

Climate Change Summary for Alternative 2

Predicted overall increases in temperatures and precipitation and changes in the patterns of their distribution (Walsh et al. 2005; Chapin et al. 2006; Chapin et al. 2010; McGuire 2015) have the potential to influence the projected effects of the project on marine mammal habitat. Changes in marine productivity could negatively affect food webs. Impacts of climate change to threatened and endangered marine mammals are extremely complex and poorly understood at this time. See Section 3.26, Climate Change, for details on affected environment for resources.

Summary of Impacts for Alternative 2

Applying the methodology defined in Table 3.14-9 to the information and data presented in this section, Alternative 2 has potential direct and indirect impacts on threatened or endangered birds. Table 3.14-10 provides a summary of impacts by the four assessment factors.

Direct and indirect effects would derive primarily from port site in-water construction / removal and fuel and cargo barge traffic. Injury and mortality are unlikely given the slow vessel speed during river travel and low occurrence of marine mammals in the Kuskokwim River. Although the probability of ship strikes for North Pacific right whales is also low, the impact of such an occurrence would directly impact the species population. With a remnant population thought to include only about 30 individuals, the loss of a single whale, particularly a reproductive female, would have population level effects.

Overall, the most likely effects on marine mammals would involve behavioral disturbance, such as temporary displacement or avoidance. Anticipated behavioral effects may not be noticeable, as animals may stay in the area, or have reactions that are obvious but temporary and do not affect life functions. Displacement or behavioral changes would only occur during brief periods as barges pass by or for the period of in-water construction noise. Disturbance would only occur in specific locations during the ice-free season where construction or barge traffic coincide with individual marine mammal occurrence. In an impacts context, the species included here are either listed as endangered (the western stock of Steller sea lions, Cook Inlet beluga whales, North Pacific right whales, humpback whales, fin whales), threatened (bearded and ringed seals, and the Southwest Alaska DPS of northern sea otters), or are candidate species for listing under the ESA (Pacific walrus), so are protected by both the ESA and MMPA.

The overall ESA effects determination in the Biological Assessment is "may affect, not likely to adversely affect" for Steller sea lions, bearded seal, ringed seal, Pacific walrus, beluga whale, humpback whale, fin whale, North Pacific right whale, and northern sea otter (Owl Ridge 2017b, Appendix O). Effects determinations are made in ESA Section 7 consultation, which is a parallel process to NEPA. See Section 3.14.1, Regulatory Framework, above for further information.

See Table 3.14-11 for a comprehensive comparison of impacts to ESA-listed marine mammal species for all alternatives. For potential effects from spills, see Section 3.24, Spills.

Table 3.14-10: Summary Impacts[1] of Alternative 2 on ESA-Listed Marine Mammals by Project Component

Impacts	Assessment Criteria			
	Magnitude or Intensity	**Duration**	**Extent or Scope**	**Context**
Mine Site: No impacts are expected because ESA-listed marine mammals do not occur in the area.				
Transportation Corridor:				
Behavioral disturbance from noise	Changes in behavior due to project activity may not be noticeable; threatened or endangered marine mammals may react but would be expected to remain in the general vicinity.	Behavior patterns may be altered infrequently during individual barge passing over the ice-free seasons of the Construction, Operation, and Closure Phases, and during port construction and removal activities. Behavior would be expected to return to pre-activity levels after actions causing impacts were to cease.	Impacts would be limited to vicinity of the Project Area (the port facilities and barge route).	Could affect several species listed as endangered or threatened under the ESA.
Risk of injury or mortality from vessel strike	Any incidents of injury or mortality would be so unlikely they are undetectable; population level effects would not be detectable, except in the case of a North Pacific right whale, in which population level effects may occur due to the rare occurrence of this species and its scattered distribution.	Events with potential for mortality or injury would continue during the ice-free season for up to the life of the project within the vicinity of barge traffic.	Impacts would be limited to vicinity of the Project Area (the barge route), with potential population-level effects across the entire population range in the case of a North Pacific right whale, due to the rare occurrence of this species and its scattered distribution.	Could affect several species listed as endangered or threatened under the ESA.
Pipeline:				

Table 3.14-10: Summary Impacts[1] of Alternative 2 on ESA-Listed Marine Mammals by Project Component

Impacts	Assessment Criteria			
	Magnitude or Intensity	**Duration**	**Extent or Scope**	**Context**
Behavioral disturbance from noise	Changes in behavior due to project activity may not be noticeable; threatened or endangered marine mammals remain in the vicinity.	Behavior patterns altered infrequently, but not longer than the span of the Construction Phase and would be expected to return to pre-activity levels after actions causing impacts were to cease.	Impacts would be in the vicinity of the Project Area, within the EIS Analysis Area in Cook Inlet, including Cook Inlet beluga whale Critical Habitat Areas.	Could affect several species listed as endangered or threatened under the ESA.
Risk of injury or mortality from vessel strike	Any incidents of injury or mortality would be so unlikely they are undetectable; population level effects would not be detectable, except in the case of a Cook Inlet beluga whale due to the current population size and Critical Habitat Area designation in Cook Inlet.	Events with potential for mortality or injury would occur in the Construction Phase within the vicinity of barge traffic, when the pipeline is being constructed.	Impacts would be in the vicinity of the Project Area (the barge route), to the regional of the EIS Analysis Area in Cook Inlet, including Cook Inlet beluga whale Critical Habitat Areas.	Affects the species listed as endangered or threatened under the ESA.

Notes:

1 The expected impacts account for impact reducing design features proposed by Donlin Gold and Standard Permit Conditions and BMPs that would be required. It does not account for additional mitigation measures being considered.

Mitigation and Monitoring for Alternative 2

Effects determinations take into account impact reducing design features (Table 5.2-1 in Chapter 5, Impact Avoidance, Minimization, and Mitigation) proposed by Donlin Gold and also the Standard Permit Conditions and BMPs (Section 5.3) that would be implemented.

Design features important for reducing impacts to ESA-protected and candidate marine mammal species include:

- Ocean fuel barges would be double hulled and have multiple isolated compartments for transporting fuel to reduce the risk of a spill;
- Barges would maintain speeds less than 10 knots (18.5 km/hr) and reduce speeds to 5 knots (9.3 km/hr) when approaching marine mammals to minimize the risk of vessel strikes; and
- The project design includes a natural gas pipeline to decrease the amount of barging to transport diesel fuel. The design decision to use a natural gas pipeline instead of barging 110 Mgal of diesel per year was in response to community concern about barge traffic volume.

Standard Permit Conditions and BMPs important for reducing impacts to ESA-protected and candidate marine mammal species include:

- Development and maintenance of ODPCPs, SPCC plans, and FRPs.

Additional measures are being considered by the Corps and Cooperating agencies and are further assessed in Chapter 5, Impact Avoidance, Minimization, and Mitigation (Section 5.5 and

Section 5.7). Examples of additional measures being considered that are applicable to this resource include:

- For marine barging in the Bearing Sea - implement measures to minimize the risk of spills, including: avoiding operation of watercraft in fall and winter and in the presence of sea ice to the extent practicable; using double-hull tanks for fuel transport to reduce tank rupture risk; and using fully-operated vessel navigation systems composed of radar, chartplotter, sonar, marine communications systems, and satellite navigation receivers, as well as automatic identification system (AIS) for vessel tracking;
- For marine barging in the Bearing Sea - either a) avoid transiting vessels through North Pacific right whale critical habitat or b) implement protective measures while transiting through North Pacific right whale critical habitat; such as maintaining a ship log for vessels transiting through designated critical habitat, reducing speed limits, and using onboard protected species observers or trained crew members. Specific training requirements as well as procedures to follow if marine mammals are observed would be specified, as necessary, in the appropriate project permit(s);
- Implement measures to reduce impacts from vessels to protected marine mammals and designated critical habitat, including:
    - Maintaining a distance 1.5 miles from the mean lower low water line (MLLW) of the Susitna Delta (MLLW line between the Little Susitna River and Beluga River) for barges transitting across the Cook Inlet;
    - Maintaining a safe distance from major Steller sea lion rookeries or haulouts (3 nm [5.5 km]) where vessel safety requirements allow and/or where practicable; and
- Time pipe staging at the Anchorage Port to avoid seasonal presence of Beluga whales in critical habitat.

3.14.3.2.3 ALTERNATIVE 3A – REDUCED DIESEL BARGING: LNG-POWERED HAUL TRUCKS

<u>Mine Site - All Phases</u>

There are no proposed changes to the Mine Site locations or operations under this alternative. Potential impacts the same as under Alternative 2.

<u>Transportation Corridor</u>

Construction Phase Impacts

The decreased diesel fuel use under this alternative would likely not require the increased storage capacity at either Dutch Harbor or Bethel that was proposed under Alternative 2. Any actions that would occur at Dutch Harbor or the Port of Bethel at the Bethel Yard Dock are not part of the proposed action, and are considered connected actions (see Section 1.2.1, Connected Actions, in Chapter 1, Project Introduction and Purpose and Need). Alternative 3A differs from Alternative 2 in that it requires fewer ocean fuel barge trips because of the decreased use of diesel fuel. The number of ocean fuel trips (14) and cargo trips (16) would be the same as under

Alternative 2. Diesel storage capacity at Angyaruaq (Jungjuk) Port would also be reduced. Reduced or eliminated need for storage would mean reduced or eliminated construction needs at these ports and reduced potential for construction-related disturbance of threatened and endangered marine mammals.

Operations Phase Impacts

Alternative 3A differs from Alternative 2 by a decrease in the number of ocean and river fuel barge trips. Fuel trips between Dutch Harbor and Bethel would decrease from 14 under Alternative 2 to five under Alternative 3A. The number of ocean cargo trips (12) would be the same as under Alternative 2. Finally, the number of river fuel barge trips between Bethel and Angyaruaq (Jungjuk) Port would decrease from 58 round trips per season to 19 round trips. The combined fuel and cargo river barge trips would, therefore, decrease from 122 round trips per season to 83 round trips (see Table 3.14-6). Fewer trips would decrease the potential for vessel (including noise) disturbance of, or collisions with, threatened and endangered marine mammals in the Kuskokwim River, the mouth of the river, and the barge corridor between Dutch Harbor and Bethel.

Closure Phase Impacts

Effects from Closure under Alternative 3A would be the same as under Alternative 2.

Pipeline — All Phases

Effects under Alternative 3A would be the same as under Alternative 2. Potential effects would be the same as under Alternative 2.

Summary of Impacts for Alternative 3A

The types of potential effects from the Transportation Corridor component of Alternative 3A would be very similar to Alternative 2 and derive primarily from port site in-water construction and fuel and cargo barge traffic. Decreased fuel barging and construction needs under Alternative 3A would, however, reduce potential impacts associated with vessel traffic and fuel spills from that anticipated under Alternative 2. Although the likelihood of impact would decrease with reduced vessel activity, potential effects would still primarily involve behavioral disturbance and temporary displacement.

Direct and indirect, and cumulative effects of Alternative 3A on threatened or endangered marine mammals would be very similar to Alternative 2 and derive primarily from port site in-water construction and fuel and cargo barge traffic. Decreased fuel barging and construction needs would, however, reduce potential impacts associated with vessel traffic between Dutch Harbor and Bethel and at the mouth of and in the Kuskokwim River from that anticipated under Alternative 2. Impacts associated with climate change would also be the same as those discussed for Alternative 2.

3.14.3.2.4 ALTERNATIVE 3B – REDUCED DIESEL BARGING: DIESEL PIPELINE

Mine Site — All Phases

There are no proposed changes to the Mine Site locations or operations under this alternative. Potential impacts the same as under Alternative 2.

Transportation Corridor

Construction Phase Impacts

Infrastructure for cargo shipments, such as docks in Bethel and Angyaruaq (Jungjuk) Port, would be the same as under Alternative 2. The diesel storage capacity in Dutch Harbor, Bethel, and at Angyaruaq (Jungjuk) Port would likely not, however, be required for Alternative 3B. Under Alternative 3B, the existing Tyonek North Foreland Barge Facility would be improved to accommodate vessels in excess of 30,000 gross tons and provide fuel unloading facilities capable of accommodating the proposed volume of diesel fuel. The dock would need to be extended an additional 1,500 feet. Dock construction at the port sites would involve pile driving. Dredging would not be required, as the dock would be extended out to the required water depth. Effects of construction would be less than those described under Alternative 2 because of the reduced activity in Kuskokwim Bay, but higher in Cook Inlet and the route leading to it because of the increased vessel trips and construction there. Construction Phase fuel and cargo barge activity would be the same as in Alternative 2 (see Table 3.14-6). Any actions that would occur at Dutch Harbor or the Port of Bethel at the Bethel Yard Dock are not part of the proposed action, and are considered connected actions (see Section 1.2.1, Connected Actions, in Chapter 1, Project Introduction and Purpose and Need).

Operations Phase Impacts

Alternative 3B would decrease peak annual barge traffic on the Kuskokwim River between Bethel and the Angyaruaq (Jungjuk) Port site from an estimated 122 river barge trips per season under Alternative 2 to 64 trips for cargo transit only. Cargo transport between marine terminals and Bethel would be the same as Alternative 2 (12 ocean barge trips per year), but fuel barge trips would be reduced from 14 to zero (see Tables 3.14-3 and 3.14-6). Decreased barge traffic on the Kuskokwim River would decrease the likelihood of potential interactions with marine mammals in Kuskokwim Bay and the Bering Sea.

Closure Phase Impacts

Effects from Closure under Alternative 3B would the same as those under Alternative 2.

Pipeline - All Phases

Under Alternative 3B, there would be an additional 12 round trips per season to transport fuel from either marine terminals in the Pacific Northwest or from the Tesoro refinery in Nikiski to Tyonek during Operations. Additional diesel tanker traffic across Cook Inlet into Tyonek could increase the potential for behavioral disturbance of Cook Inlet beluga whales, particularly during fall and winter, as the shipping route traverses Cook Inlet Beluga Critical Habitat Area 2, with known fall and winter use. Overall, potential effects would likely involve behavioral disturbance and be temporary for the duration of a tanker passing by, localized in the vicinity of vessel traffic, and may include some behavioral modifications that are not likely to exceed temporary avoidance. The disturbance to Cook Inlet beluga whales depends on the tanker schedule and the extent to which vessel traffic and beluga whales coincide.

Two options to Alternative 3B have been added based on Draft EIS comments from agencies and the public:

- Port MacKenzie Option: The Port MacKenzie Option would utilize the existing Port MacKenzie facility to receive and unload diesel tankers instead of the Tyonek facility considered under Alternative 3B. A pumping station and tank farm of similar size to the Tyonek conceptual design would be provided at Port MacKenzie. A pipeline would extend northwest from Port MacKenzie, route around the Susitna Flats State Game Refuge, cross the Little Susitna and Susitna rivers, and connect with the Alternative 3B alignment at approximately MP 28. In this option, there would be no improvements to the existing Tyonek dock; a pumping station and tank farm would not be constructed near Tyonek; and the pipeline from the Tyonek tank farm considered under Alternative 3B to MP 28 would not be constructed.
- Collocated Natural Gas and Diesel Pipeline Option: The Collocated Natural Gas and Diesel Pipeline Option (Collocated Pipeline Option) would add the 14-inch-diameter natural gas pipeline proposed under Alternative 2 to Alternative 3B. Under this option, the power plant would operate primarily on natural gas instead of diesel as proposed under Alternative 3B. The diesel pipeline would deliver the diesel that would be supplied using river barges under Alternative 2 and because it would not be supplying the power plant, could be reduced to an 8-inch-diameter pipeline. The two pipelines would be constructed in a single trench that would be slightly wider than proposed under either Alternative 2 or Alternative 3B and the work space would be five feet wider. The permanent pipeline ROW would be approximately two feet wider. This option could be configured with either the Tyonek or Port MacKenzie dock options.

Summary of Impacts for Alternative 3B

The types of potential effects from the Transportation Corridor component of Alternative 3B would be very similar to Alternative 2 and derive primarily from port site in-water construction and fuel and cargo barge traffic. Decreased fuel barging and construction needs under Alternative 3A would, however, reduce potential impacts associated with vessel traffic and fuel spills from that anticipated under Alternative 2. Although the likelihood of impact would decrease with reduced vessel activity, potential effects would still primarily involve behavioral disturbance and temporary displacement. Sea otters in the vicinity of Dutch Harbor are unlikely to be disturbed by the periodic vessel traffic into and out of the harbor.

Direct and indirect, and cumulative effects of Alternative 3B on threatened or endangered marine mammals would be very similar to Alternative 2 and derive primarily from port site in-water construction and fuel and cargo barge traffic. Decreased fuel barging and construction needs would, however, reduce potential impacts associated with vessel traffic between Dutch Harbor and Bethel and at the mouth of and in the Kuskokwim River from that anticipated under Alternative 2. Impacts associated with climate change would also be the same as those discussed for Alternative 2.

3.14.3.2.5 ALTERNATIVE 4 – BIRCH TREE CROSSING PORT

Because the activities of Alternative 4 in the areas where threatened and endangered marine mammals would occur would be the same as those of Alternative 2, the potential direct and indirect impacts under Alternative 4 would be the same as those described above under Alternative 2 for the Mine Site, Transportation Corridor and the Pipeline components. Impacts associated with climate change would also be the same as those discussed for Alternative 2.

3.14.3.2.6 ALTERNATIVE 5A – DRY STACK TAILINGS

This alternative includes two options:

- Unlined Option: The TSF would not be lined with an LLDPE liner. The area would be cleared and grubbed and an underdrain system placed in the major tributaries under the TSF and operating pond to intercept groundwater base flows and infiltration through the DST and convey it to a Seepage Recovery System (SRS). Water collecting in the SRS pond would be pumped to the operating pond, lower CWD, or directly to the processing plant for use in process.
- Lined Option: The DST would be underlain by a pumped overdrain layer throughout the footprint, with an impermeable LLDPE liner below. The rock underdrain and foundation preparation would be completed in the same manner as the Unlined Option.

Because the activities of Alternative 5A in the areas where threatened and endangered marine mammals would occur would be the same as those of Alternative 2, the potential direct and indirect impacts under Alternative 5A would the same as those described above under Alternative 2 for the Mine Site and the Pipeline components. Impacts would be similar in the Transportation Corridor as there would be 7 additional fuel barge trips from Bethel to Angyaruaq (Jungjuk) Port site during Operations (for a total of 71 instead of 64; see Table 3.14-3). Impacts associated with climate change would also be the same as those discussed for Alternative 2.

3.14.3.2.7 ALTERNATIVE 6A – MODIFIED NATURAL GAS PIPELINE ALIGNMENT: DALZELL GORGE ROUTE

Because the activities of Alternative 6A in the areas where threatened and endangered marine mammals would occur would be the same as those of Alternative 2, the potential direct and indirect impacts under Alternative 6A would be similar to those described above under Alternative 2 for the Mine Site, Transportation Corridor and the Pipeline components. Impacts associated with climate change would also be the same as those discussed for Alternative 2.

3.14.3.2.8 ALTERNATIVES IMPACT COMPARISON

A comparison of the impacts on listed marine mammals by alternative is presented in Table 3.14-11. The primary project component that could affect listed marine mammals is the increase in river and ocean traffic in the Transportation Corridor; therefore alternatives 2, 4, and 6, which would all have 30 ocean barge trips and 89 river barge trips per year (Construction Phase), and 26 ocean barge trips and 122 river barge trips per year (Operations Phase), all have the same potential for impacts on listed or candidate marine mammals (except for North Pacific right whales, for which the impacts would directly impact the species population in the unlikely event that one is hit). Alternative 4 has a shorter barge distance along the Kuskokwim River, but this is not expected to change impacts to ESA-listed marine mammals. Alternative 5A has slightly more river trips (129 compared to 122) during the Operations Phase, and impacts are expected to be similar to those of Alternative 2.

Under Alternative 3A there would be fewer ocean barge trips (17 compared to 26) and river barge trips (83 compared to 122) during the Operations Phase, thus reducing the potential for impacts compared to Alternative 2.

Under Alternative 3B there would be fewer ocean barge trips (12 compared to 26) and river trips (64 compared to 122) during the Operations Phase, but there would be 12 trips through Cook Inlet during Construction and Operations. Therefore, risks to Cook Inlet beluga whales increase under Alternative 3B compared to Alternative 2.

Table 3.14-11: Comparison by Alternative for ESA-Listed Marine Mammals*

	Alternative 2 – Donlin Gold's Proposed Action	Alternative 3A - LNG-Powered Haul Trucks	Alternative 3B – Diesel Pipeline	Alternative 4 – Birch Tree Crossing (BTC) Port	Alternative 5A – Dry Stack Tailings	Alternative 6A – Dalzell Gorge Route
Impact-Causing Project Components						
Increased river and ocean barge traffic from baseline volume	Transportation Corridor: 50 river cargo trips per year to Angyaruaq (Jungjuk) Port Site (Construction Phase) 64 river cargo trips per year to Angyaruaq (Jungjuk) Port Site (Operations Phase) 19 river fuel trips per year to Angyaruaq (Jungjuk) Port Site (Construction Phase) 58 river fuel trips per year to Angyaruaq (Jungjuk) Port Site (Operations Phase) 20 pipe and equipment barges to staging area near Devil's Elbow, above Stony River (during first two years of pipeline construction - Construction Phase) 16 ocean cargo trips per year to Bethel (Construction Phase) 12 ocean cargo trips per year to Bethel (Operations Phase) 14 ocean fuel trips per year to Bethel (both Construction and Operations Phases) Pipeline: 20 ocean barges during the first year of pipeline construction from Anchorage to Beluga Landing Totals - Transportation Corridor: 89 river trips per year (Construction	Difference from Alternative 2 - Transportation Corridor: 19 river fuel trips per year to Angyaruaq (Jungjuk) Port Site (Operations Phase) 5 ocean barge fuel trips per year to Bethel (Operations Phase) Totals - Transportation Corridor: 83 river trips per year (Operations Phase) 17 ocean trips per year to Bethel (Operations Phase)	Difference from Alternative 2 - Transportation Corridor: No river fuel trips per year to Angyaruaq (Jungjuk) Port Site (Operations Phase) No ocean barge fuel trips per year to Bethel (Operations Phase) Difference from Alternative 2 - Pipeline: 12 ocean trips per year to Tyonek (Operations Phase) Totals - Transportation Corridor: 64 river trips per year (Operations Phase) 12 ocean trips per year to Bethel (Operations Phase) Totals - Pipeline: 12 ocean trips per year to Tyonek (Operations Phase)	Difference from Alternative 2 - Transportation Corridor: -river trips would only go as far as Birch Tree Crossing Port Site, rather than Angyaruaq (Jungjuk) Port Site, which will not change impacts as ESA-listed marine mammal habitat is located downstream of either port site, closer to Bethel.	Difference from Alternative 2 - Transportation Corridor: 71 river cargo trips per year to Angyaruaq (Jungjuk) Port Site (Operations Phase) Totals - Transportation Corridor: 129 river trips per year (Operations Phase)	Same as Alternative 2.

Table 3.14-11: Comparison by Alternative for ESA-Listed Marine Mammals*

	Alternative 2 – Donlin Gold's Proposed Action	Alternative 3A - LNG-Powered Haul Trucks	Alternative 3B – Diesel Pipeline	Alternative 4 – Birch Tree Crossing (BTC) Port	Alternative 5A – Dry Stack Tailings	Alternative 6A – Dalzell Gorge Route
	Phase) 122 river trips per year (Operations Phase) 30 ocean trips per year to Bethel (Construction Phase) 26 ocean trips per year to Bethel (Operations Phase) Totals - Pipeline: 20 ocean trips (first year, Construction Phase)					
Direct or Indirect Impacts						
Behavioral disturbance	-Potential for behavioral disturbance exists from river and ocean barge trips in the Transportation Corridor and Pipeline components. -There would be no impacts in the Mine Site component as no ESA-listed marine mammal species are known to occur there.	Compared to Alternative 2, this Alternative reduces total trips in the Transportation Corridor: -from 122 river trips to 83 river trips (Operations Phase) -from 26 ocean trips to 17 ocean trips (Operations Phase) -This Alternative would lower the potential for behavioral disturbance in the Transportation	Compared to Alternative 2, this Alternative reduces total trips in the Transportation Corridor: -from 122 river trips to 58 river trips (Operations Phase) -from 26 ocean trips to 12 trips (Operations Phase) -This Alternative would have the lowest potential for behavioral disturbance in the Transportation Corridor. This Alternative increases total ocean trips in the Pipeline	Same as Alternative 2.	Compared to Alternative 2, this Alternative increases total trips in the Transportation Corridor: -from 122 river trips to 129 river trips (Operations Phase) -This alternative would slightly raise the potential for behavioral disturbance in the Transportation	Same as Alternative 2

Table 3.14-11: Comparison by Alternative for ESA-Listed Marine Mammals*

	Alternative 2 – Donlin Gold's Proposed Action	Alternative 3A - LNG-Powered Haul Trucks	Alternative 3B – Diesel Pipeline	Alternative 4 – Birch Tree Crossing (BTC) Port	Alternative 5A – Dry Stack Tailings	Alternative 6A – Dalzell Gorge Route
		Corridor. -Pipeline component impacts would be the same as Alternative 2. -There would be no impacts in the Mine Site component as no ESA-listed marine mammal species are known to occur there.	<u>component:</u> -Additional 12 ocean barge trips to Tyonek (Operations Phase) increases the potential for adverse behavioral impacts (depending on the tanker schedule in Cook Inlet relative to distribution of Cook Inlet beluga whales). -There would be no impacts in the Mine Site component as no ESA-listed marine mammal species are known to occur there.		Corridor. -Pipeline component impacts would be the same as Alternative 2. -There would be no impacts in the Mine Site component as no ESA-listed marine mammal species are known to occur there.	
Risk of injury or mortality from collisions	-Risk of injury or mortality from collisions exists from river and ocean barge trips in the Transportation Corridor and Pipeline components. -Potential for population -level impacts if a North Pacific right whale is struck due to rare occurrence and scattered distribution in the Transportation Corridor. -Potential for population concern if a Cook Inlet beluga is struck due to Critical Habitat Area designation in Cook Inlet in the Pipeline component. -There would be no impacts in the Mine Site component as no ESA-listed	<u>Compared to Alternative 2, this Alternative reduces total trips in the Transportation Corridor:</u> -from 122 river trips to 83 river trips (Operations Phase) -from 26 ocean trips to ocean 17 trips (Operations Phase)	<u>Compared to Alternative 2, this Alternative reduces total trips in the Transportation Corridor:</u> -from 122 river trips to 58 river trips (Operations Phase) -from 26 ocean trips to 12 trips (Operations Phase) -This alternative would have the lowest risk of injury or mortality from	Same as Alternative 2.	<u>Compared to Alternative 2, this Alternative increases total trips in the Transportation Corridor:</u> -from 122 river trips to 129 river trips (Operations Phase) -This alternative would slightly raise the risk of	Same as Alternative 2.

Table 3.14-11: Comparison by Alternative for ESA-Listed Marine Mammals*

	Alternative 2 – Donlin Gold's Proposed Action	Alternative 3A - LNG-Powered Haul Trucks	Alternative 3B – Diesel Pipeline	Alternative 4 – Birch Tree Crossing (BTC) Port	Alternative 5A – Dry Stack Tailings	Alternative 6A – Dalzell Gorge Route
	marine mammal species are known to occur there.	-This alternative would lower the risk of injury or mortality from collisions in the Transportation Corridor. -Pipeline component impacts would be the same as Alternative 2. -There would be no impacts in the Mine Site component as no ESA-listed marine mammal species are known to occur there.	collisions in the Transportation Corridor. This Alternative increases total ocean trips in the Pipeline component: -Additional 12 ocean barge trips to Tyonek (Operations Phase) increases the risk of injury or mortality from collisions for Cook Inlet beluga whales (depending on the tanker schedule in Cook Inlet relative to distribution of this species). -There would be no impacts in the Mine Site component as no ESA-listed marine mammal species are known to occur there.		injury or mortality from collisions in the Transportation Corridor. -Pipeline component impacts would be the same as Alternative 2. -There would be no impacts in the Mine Site component as no ESA-listed marine mammal species are known to occur there.	

Notes:

*The No Action Alternative would have no new impacts on ESA-listed marine mammals. There are no impacts at the Mine Site as these species do not occur here.