DEPARTMENT OF THE ARMY
ALASKA DISTRICT, U.S. ARMY CORPS OF ENGINEERS
REGULATORY DIVISION
1046 MARKS ROAD
FORT WAINWRIGHT, ALASKA 99703

July 9, 2026

Regulatory Division
POA-2010-00286

Mr. Benjamin Storey
Alaska Department of Transportation and Public Facilities
PO Box 112506
Juneau, Alaska 99811

Dear Mr. Storey:

Enclosed is the signed Department of the Army (DA) permit, file number POA-2010-00286, Kinzarof Lagoon which authorizes construction of a new 18.9-mile long, single-lane, unpaved road, owned by King Cove Corporation, connecting existing roads from the community of King Cove to the road system and to the all-weather airport at Cold Bay. The proposed road will be 13 feet wide at the surface and 24 feet wide subgrade with 113 vehicle turnout spaces. The proposed project will discharge 40,000 cubic yards of gravel and riprap fill material into waters of the United States, and mechanically clear wetlands and other waters to construct the roadway. The proposed discharges will occur in 4.58 acres of palustrine scrub-shrub and emergent freshwater wetlands and 0.70-acre of stream channels. Approximately eighty-five drainage culverts and one bridge will be installed. Sources of gravel and other rock material for road construction will be obtained from uplands at two dedicated material sites and from 14 other upland locations along the road corridor.

The project location will begin at Latitude 55.249398 º N., Longitude 162.506574 º W. approximately 23 road miles northwest of the community of King Cove; and end at Latitude 55.247001º N., Longitude 162.757773º W., approximately 5 road miles northwest of the community of Cold Bay, Alaska. The proposed road will connect to existing roads at the eastern end to reach King Cove and at the western end to reach Cold Bay.

If changes to the plans or location of the work are necessary for any reason, plans must be submitted to us immediately. Federal law requires approval of any changes before construction begins.

This permit should not be considered as an approval of the design features of any activity authorized or an implication that such construction is considered adequate for any purpose intended. It does not authorize any damages to private property, invasion of private rights, or any infringement of federal, state, or local laws or regulations.

Please contact me via email at John.C.Sargent@usace.army.mil, by mail at the address above, by phone at (907) 347-1801, or toll free from within Alaska at (800) 478-2712, if you have questions or to request a hard copy of this letter and enclosures. For more information about the Regulatory Program, please visit our website at www.poa.usace.army.mil/Missions/Regulatory.

Sincerely,

John.c.Sargent

John Sargent
Project Manager

Enclosures

This notice of authorization must be conspicuously displayed at the site of work.

United States Army Corps of Engineers
Kinzarof Lagoon

A permit to discharge fill material in 4.58 acres of palustrine scrub-shrub and emergent freshwater wetlands and 0.70-acre of stream channels for construction of 18.9-mile single lane unpaved road connecting communities of King Cove with Cold Bay.

at: Latitude 55.249398 º N., Longitude 162.506574 º W. approximately 23 road miles northwest of the community of King Cove; and would end at Latitude 55.247001º N., Longitude 162.757773º W., approximately 5 road miles northwest of the community of Cold Bay, Alaska.

has been issued to: Alaska Department of Transportation and Public Facilities, Mr. Ben Storey

on: July 09, 2026 and expires: July 31, 2031

Address of Permittee: PO Box 112506, Juneau, Alaska 99811

Permit Number:

POA-2010-00286

John.c.Sargent

FOR: ***District Commander***
John Sargent
Project Manager
REGULATORY DIVISION

ENG FORM 4336, Jul 81 (33 CFR 320-330) EDITION OF JUL 70 MAY BE USED (Proponent: CECW-O)

DEPARTMENT OF THE ARMY PERMIT

Permittee: Mr. Benjamin Storey, Alaska Department of Transportation and Public Facilities

Permit No.: POA-2010-00286

Issuing Office: U.S. Army Engineer District, Alaska

NOTE: The term "you" and its derivatives, as used in this permit, means the Permittee or any future transferee. The term "this office" refers to the appropriate district or division office of the Corps of Engineers having jurisdiction over the permitted activity or the appropriate official of that office acting under the authority of the commanding officer.

You are authorized to perform work in accordance with the terms and conditions specified below.

Project Description: The project will construct an 18.9-mile long, single-lane, unpaved road, owned by King Cove Corporation, connecting existing roads from the community of King Cove to the road system and to the all-weather airport at Cold Bay. The proposed road will be 13 feet wide at the surface and 24 feet wide subgrade with 113 vehicle turnout spaces. The proposed project will discharge 40,000 cubic yards of gravel and riprap fill material into waters of the United States, and mechanically clear wetlands and other waters to construct the roadway. The proposed discharges will occur in 4.58 acres of palustrine scrub-shrub and emergent freshwater wetlands and 0.70-acre of stream channels. Approximately eighty-five drainage culverts and one bridge will be installed. Sources of gravel and other rock material for road construction will be obtained from uplands at two dedicated material sites and from 14 other upland locations along the road corridor.

All work will be performed in accordance with the attached plan, sheets 1-21, dated 11/18/2025 and 6/24/2026.

Project Location:

The project will begin at Latitude 55.249398 º N., Longitude 162.506574 º W. approximately 23 road miles northwest of the community of King Cove; and will end at Latitude 55.247001º N., Longitude 162.757773º W., approximately 5 road miles northwest of the community of Cold Bay, Alaska. The proposed road will connect to existing roads at the eastern end to reach King Cove and at the western end to reach Cold Bay.

Permit Conditions:

General Conditions:

1. The time limit for completing the authorized work ends on **July 31, 2031**.

   If you find that you need more time to complete the authorized activity, submit your request for a time extension to this office for consideration at least one month before the above date is reached, or for a permit renewal contact this office for consideration at least six months before the above date is reached.

2. You must maintain the activity authorized by this permit in conformance with the terms and conditions of this permit. You are not relieved of this requirement if you abandon the permitted activity, although you may make a good faith transfer to a third party in compliance with General Condition 4 below. Should you wish to cease to maintain the authorized activity, or should you desire to abandon it without a good faith transfer, you must obtain a modification of this permit from this office, which may require restoration of the area.

3. If you discover any previously unknown historic or archeological remains while accomplishing the activity authorized by this permit, you must immediately notify this office of what you have found. We will initiate the Federal and State coordination required to determine if the remains warrant a recovery effort or if the site is eligible for listing in the National Register of Historic Places.

4. If you sell the property associated with this permit, you must obtain the signature of the new owner in the space provided and forward a copy of the permit to this office to validate the transfer of this authorization.

5. A conditioned water quality certification has been issued for your project, and you must comply with the conditions specified in the certification as special conditions to this permit. For your convenience, a copy of the certification is attached.

6. You must allow representatives from this office to inspect the authorized activity at any time deemed necessary to ensure that it is being or has been accomplished in accordance with the terms and conditions of your permit.

Special Conditions:

Pre-Construction Meeting:

1. The permittee shall convene a pre-construction meeting with their contractor representatives present, a minimum of 15 days prior to the discharge of fill material into waters of the US authorized under this DA permit. The permittee shall invite the USACE, and appropriate federal, state and borough resource or regulatory agencies within 10 days of the meeting date. The permittee shall provide copies of the DA permit and all attachments to all contractor representatives who shall make the permit copies available at all times in the field during construction activities.

Fill Discharges:

2. The Permittee shall use only clean fill material for this project. The fill material shall be free from items such as trash, debris, automotive parts, asphalt, construction materials, concrete blocks with exposed reinforcement bars, and soils contaminated with any toxic substance, in toxic amounts in accordance with Section 307 of the Clean Water Act.

3. The Permittee shall install erosion control measures along the perimeter of all work areas to prevent the displacement of fill material outside the authorized work area. The erosion control measures shall remain in place and be maintained until all authorized work is completed and the work areas are stabilized. To the maximum extent practicable, plastic-free erosion and sediment control products such as netting manufactured from 100-percent biodegradable materials like jute, sisal or coir fiber shall be used for erosion control. Immediately after completion of the final grading of the land surface, all slopes, land surfaces, and filled areas shall be stabilized using sod, degradable mats, barriers, or a combination of similar stabilizing materials to prevent erosion.

4. Snow and ice clearing operations shall not result in the discharge of vegetation, soil or debris into waters of the U.S. outside of all authorized fill areas.

Mitigative measure to minimize impacts to streams, floodplains, and fish habitat:

5. Existing (natural) drainage patterns shall be maintained throughout all construction and operation periods by the installation and maintenance of culverts in all authorized fill areas in sufficient number and size to prevent ponding, dewatering, and water diversions between watersheds. Culverts in fish-bearing streams shall be designed to maintain a natural channel and natural stream bed characteristics. This embedded stream simulation design shall maintain fish passage by retaining the natural stream slope, bankfull flow, water velocity, and depth patterns similar to the natural (undisturbed) stream reaches upstream and downstream of the culvert location. For

example, see the U.S. Fish and Wildlife Service's *Culvert Design Guidelines for Ecological Function (https://www.fws.gov/alaska-culvert-design-guidelines)*.

6. Final cross-drainage culvert locations shall be determined in the field during breakup and locations staked. Existing (natural) drainage patterns shall be maintained throughout all construction and operation periods by the installation of culverts in all authorized fill areas in sufficient number and size to prevent ponding, dewatering, water diversion between watersheds, or concentrating runoff flows and to ensure that hydrology is not altered.

7. Essential Fish Habitat-The applicant shall implement the conservation measures the King Cove Corporation had agreed to and outlined in the attached FWS letter to NMFS dated July 25, 2025.

8. Activities in fish spawning areas during spawning seasons shall be avoided to the maximum extent practicable.

9. Stream crossings shall preserve floodplain connectivity to the greatest extent possible.

10. Overflow culverts should be at the same grade level as the floodplain and placed to match the flood-flow patterns in the floodplain.

11. Gravel and other construction materials shall not be taken from streambeds, riverbeds, active floodplains, lakeshore or outlets of lakes except to salvage streambed material for culvert in-fill at fish passage crossings.

12. Where it is practicable, a 100-foot undisturbed vegetation buffer shall be maintained along ponds, lakes, creeks, rivers or higher-value wetland (fens, emergent wetlands and moss-lichen wetlands). The buffer width shall start from the edge of the riparian area associated with the waterbodies or from the edge of the higher value wetland.

13. The permittee shall prepare and submit a culvert monitoring report to the Corps for three summer seasons following completion of the fill placement for the road construction. The reports shall be submitted prior to December 31 of each year. The report shall include photographs of at least 20% of the crossings to demonstrate the hydrologic conditions at spring break-up time and post break-up (summer conditions). In addition, the report shall include photographs (and locations photographs were taken) and an evaluation of all areas where additional culverts or changes to design are necessary to retain existing drainage patterns, improve fish passage, and where culvert maintenance, repair, upgrade, setting adjustments or replacement are necessary.

Floodplains:

14. To comply with Executive Order 11988, disturbance in floodplains shall be avoided where practicable. When avoidance is not practicable, floodplain disturbance will be minimized and floodplain function maintained or restored to the extent practicable.

15. A 100-year flood standard (or larger) shall be used for conveyance of all stream simulation and other moderate and major culverts and bridges.

Activities Involving Trenching:

16. Trenches may not be constructed or backfilled in such a manner as to drain waters of the U.S. (e.g., backfilling with extensive gravel layers, creating a French drain effect). Ditch plugs or other methods shall be used to prevent this situation. Except for material placed as minor trench over-fill or surcharge necessary to offset subsidence or compaction, all excess materials shall be removed to a non-wetland location. The backfilled trench shall achieve the pre-construction elevation within a year of disturbance unless climatic conditions warrant additional time. The

additional time must be approved by the Corps of Engineers. Excavated material temporarily side cast into wetlands shall be underlain with ice pads, geotextile or similar material, to allow for removal of the temporary material to the maximum extent practicable.

Site Restoration of Ground Disturbing Activities:

17. Disturbed areas shall be stabilized immediately after construction to prevent soil erosion. Where practicable, native vegetation and topsoil removed for project construction shall be used for site rehabilitation.

Airborne Dust:

18. The permittee shall ensure pollution to aquatic resources from road gravel spray and fine airborne dust discharges are minimized to the maximum extent practicable. Compliance with this condition shall be determined by the absence of visible dust and gravel on wetland vegetation adjacent to the authorized fill areas.

19. Dust suppressants with ingredients potentially harmful to aquatic organisms shall not be used.

Endangered Species Act:

20. This permit does not authorize the Permittee to take an endangered species, in particular, the Steller's eider and the sea otter nor modify these species' critical habitat. In order to legally take a listed species, the Permittee must have separate authorization under the Endangered Species Act (ESA) (e.g., an ESA Section 10 permit, or a Biological Opinion (BO) under ESA Section 7, with "incidental take" provisions with which you must comply).

    The enclosed Biological Opinion (BO) (FWS/R7/SAFWFO/2026-0057356, dated June 18, 2026) contains mandatory terms and conditions to implement the reasonable and prudent measures that are associated with "incidental take" that is also specified in the BO. Authorization under this permit is conditional upon compliance with all of the mandatory terms and conditions associated with incidental take of the enclosed BO, which terms and conditions are incorporated by reference in this permit. Failure to comply with the terms and conditions associated with incidental take of the BO, where a take of the listed species occurs would constitute an unauthorized take, and it would also constitute noncompliance with this permit. The United States Fish and Wildlife Service is the appropriate authority to determine compliance with the terms and conditions of its BO, and with the ESA.

21. The permittee shall comply with the Federal Endangered Species Act. You must implement all of the mitigating measures identified in the enclosed National Marine Fisheries Service letter of concurrence (AKRO-2025-01895), dated August 7, 2025), including those ascribed to the United States Army Corps of Engineers therein. If you are unable to implement any of these measures, you must immediately notify the United States Army Corps of Engineers and the National Marine Fisheries Service so we may consult as appropriate, prior to initiating the work, in accordance with Federal law.

Migratory Birds and Bald and Golden Eagles:

22. The permittee is responsible for ensuring the project complies with the Migratory Bird Treaty Act and the Bald and Golden Eagle Protection Act. The permittee is responsible for contacting the appropriate local office of the U.S. Fish and Wildlife Service to determine what measures, if any are necessary or appropriate to reduce adverse effects to migratory birds or eagles, including whether incidental take permits are necessary and available under the Migratory Bird Treaty Act or Bald Eagle and Golden Eagle Protection Act.

23. Activities in wetland and waterbody habitats that serve as breeding areas for migratory birds shall be avoided to the maximum extent practicable.

Public Safety:

24. The permittee shall follow best management practices if Unexploded Ordinance (UXO) or Discarded Military Munitions, should they be found (https://www.denix.osd.mil/uxo/). If suspected unexploded ordinance (UXO) or Discarded Military Munitions (DMM) are discovered, do not approach, touch or disturb the item. Do not use your cell phone or other electronic device near the item. Retreat the same way you came and call 911 immediately.

25. A visual inspection for UXO/DMM shall be conducted prior to ground disturbing activities commence. The visual inspection will include the entire areas to be disturbed, within areas potentially impacted by military munitions, to help reduce potential construction activity impacts.

26. The permittee shall ensure that all site workers conducting ground disturbing activities shall be given a briefing by a qualified individual about the site risks of UXO/DMM, site history, results of visual inspection and the 3R requirements.

27. The permittee shall develop and make available to the public best practices for public safety during use of the roadway and off-road trails. This shall include information to identify, avoid and report unexploded ordinances and discarded military munitions, practices to minimize risks of collisions with wildlife and practices to minimize unnecessary disturbances to wildlife. This information shall be coordinated with the Corps of Engineers, King Cove Corporation, and the Izembek Refuge, and shall be made available to the public within 1 year of completion of the proposed road.

Historic Properties/Cultural Resources:

28. The permittee shall implement the attached Programmatic Agreement (PA), entitled Programmatic Agreement by and Among the Corps of Engineers, and the Alaska State Historic Preservation Officer Regarding the King Cove to Cold Bay Road Project, Alaska, and fully signed on July 8, 2026. If you fail to comply with the implementation and associated enforcement of the PA, the Corps may determine that you are out of compliance with the conditions of the Department of the Army permit/verification and suspend the permit. Suspension may result in modification or revocation of the DA permit which authorized the work.

29. If human remains, historic resources, or archeological resources are encountered during construction, all ground disturbing activities shall cease in the immediate area and the applicant shall immediately (within one business day of discovery) notify the U.S. Army Corps of Engineers (Corps), Alaska District, Regulatory Office at 1046 Marks Road, Fort Wainwright, Fairbanks, Alaska 99703, (907) 347-1801, and to Regpagemaster@usace.army. Upon notification the Corps shall notify the State Historic Preservation Office (SHPO). Based on the circumstances of the discovery, equity to all parties and consideration of the public interest, the Corps may modify, suspend or revoke the permit in accordance with 33 CFR 325.7. After such notification, the project activities on federal lands shall not resume without written authorization from the Corps, SHPO, and permittee. After such notification, project activities on tribal lands shall not resume without written authorization from the SHPO and the Corps.

Geotechnical Investigations:

30. The permittee shall avoid the use of materials containing naturally occurring asbestos (NOA is defined as 0.1 percent asbestos by mass) to the greatest extent practicable. If use of NOA materials cannot be avoided, the fill material and road cuts shall be capped with non-NOA materials in order to not expose NOA to the air, and shall follow DOT&PF measures as allowed under 17 Alaska Administrative Code 97 and described in May 14, 2015, regulations regarding the use of materials containing NOA.

Aquatic Invasive Species Control:

31. Best management practices for preventing the introduction of invasive aquatic species shall be implemented, such as thoroughly washing equipment before deployment on and off site and using native seed mixes on disturbed soils to suppress and compete with invasive species in the seed bank.

Protection of Water Circulation Patterns:

32. The permittee shall ensure that the project minimizes alterations to water circulation patterns to the extent practicable. If it is determined by the United States Army Corps of Engineers that the project negatively impacts the hydrology within WOTUS, as evidenced by ponding water, or drying of soils and vegetation, change in deposition patterns or other negative secondary impacts adjacent to the project footprint, the permittee may be required to take additional measures (i.e. install additional depressed road beds, culvert(s), or a similar water conduit) in the authorized project to re-establish the hydrology of the area to that of pre-construction conditions.

Contractors:

33. All contractors involved in this permitted activity shall be provided copies of this permit in its entirety. A copy shall remain on site at all times during construction and the terms and conditions of the authorization shall be reviewed by the contractor(s) prior to commencement of activities authorized in the DA permit.

Permit Posting:

34. The Permittee shall have available and maintain for review a copy of this permit and approved plans at the construction site.

Self-Certification:

35. Within 60 days of completion of the work authorized by this permit, the Permittee shall complete the attached “Self-Certification Statement of Compliance” form and submit it to the Corps at regpagemaster@usace.army.mil or hard copy at U.S. Army Corps of Engineers, Regulatory Division, 1046 Marks Road, Fort Wainwright, AK 99703). In the event that the completed work deviates in any manner from the authorized work, the Permittee shall describe the deviations between the work authorized by this permit and the work as constructed on the “Self-Certification Statement of Compliance” form. The description of any deviations on the “Self-Certification Statement of Compliance” form does not constitute approval of any deviations by the Corps.

Modifications:

36. Should any other agency require and/or approve changes to the work authorized or obligated by this permit, the Permittee is advised a modification to this permit may be required prior to initiation of those changes. It is the Permittee’s responsibility to request a modification of this permit. The Corps reserves the right to fully evaluate, amend, and approve or deny the request for modification of this permit.

Further Information:

1. Congressional Authorities: You have been authorized to undertake the activity described above pursuant to:
   (X) Section 404 of the Clean Water Act (33 U.S.C. 1344).

2. Limits of this authorization.

a. This permit does not obviate the need to obtain other Federal, State, or local authorization required by law.
b. This permit does not grant any property rights or exclusive privileges.
c. This permit does not authorize any injury to the property or rights of others.
d. This permit does not authorize interference with any existing or proposed Federal project.

3. Limits of Federal Liability. In issuing this permit, the Federal Government does not assume any liability for the following:
   a. Damages to the permitted project or uses thereof as a result of other permitted or unpermitted activities or from natural causes.
   b. Damages to the permitted project or uses thereof as a result of current or future activities undertaken by or on behalf of the United States in the public interest.
   c. Damages to persons, property, or to other permitted or unpermitted activities or structures caused by the activity authorized by this permit.
   d. Design or construction deficiencies associated with the permitted work.
   e. Damage claims associated with any future modification, suspension, or revocation of this permit.

4. Reliance on Applicant's Data: The determination of this office that issuance of this permit is not contrary to the public interest was made in reliance on the information you provided.

5. Reevaluation of Permit Decision. This office may reevaluate its decision on this permit at any time the circumstances warrant. Circumstances that could require a revaluation include, but are not limited to, the following:
   a. You fail to comply with the terms and conditions of this permit.
   b. The information provided by you in support of your permit application proves to have been false, incomplete, or inaccurate (See 4 above).
   c. Significant new information surfaces which this office did not consider in reaching the original public interest decision.

   Such a reevaluation may result in a determination that it is appropriate to use the suspension, modification, and revocation procedures contained in 33 CFR 325.7 or enforcement procedures such as those contained in 33 CFR 326.4 and 326.5. The referenced enforcement procedures provide for the issuance of an administrative order requiring you to comply with the terms and conditions of your permit and for the initiation of legal action where appropriate. You will be required to pay for any corrective measures ordered by this office, and if you fail to comply with such directive, this office may in certain situations (such as those specified in 33 CFR 209.170) accomplish the corrective measures by contract or otherwise and bill you for the cost.

6. Extensions. General Condition 1 establishes a time limit for the completion of the activity authorized by this permit. Unless there are circumstances requiring either a prompt completion of the authorized activity or a reevaluation of the public interest decision, USACE will normally give favorable consideration to a request for an extension of this time limit.

Your signature below, as Permittee, indicates that you accept and agree to comply with the terms and conditions of this permit.

Regional Environmental Manager, ADOT&PF Southcoast Region ____________ July 9, 2026

(PERMITTEE) AND TITLE (DATE)

This permit becomes effective when the Federal official, designated to act for the Secretary of the Army, has signed below.

John.c.Sargent

FOR (DISTRICT COMMANDER)
Colonel Victor Trujillo II
John Sargent
Project Manager
North Branch, Regulatory Division

July 9, 2026
(DATE)

When the structures or work authorized by this permit are still in existence at the time the property is transferred the terms and conditions of this permit will continue to be binding on the new owner(s) of the property. To validate the transfer of this permit and the associated liabilities associated with compliance with its terms and conditions have the transferee sign and date below.

(TRANSFEREE)

(DATE)

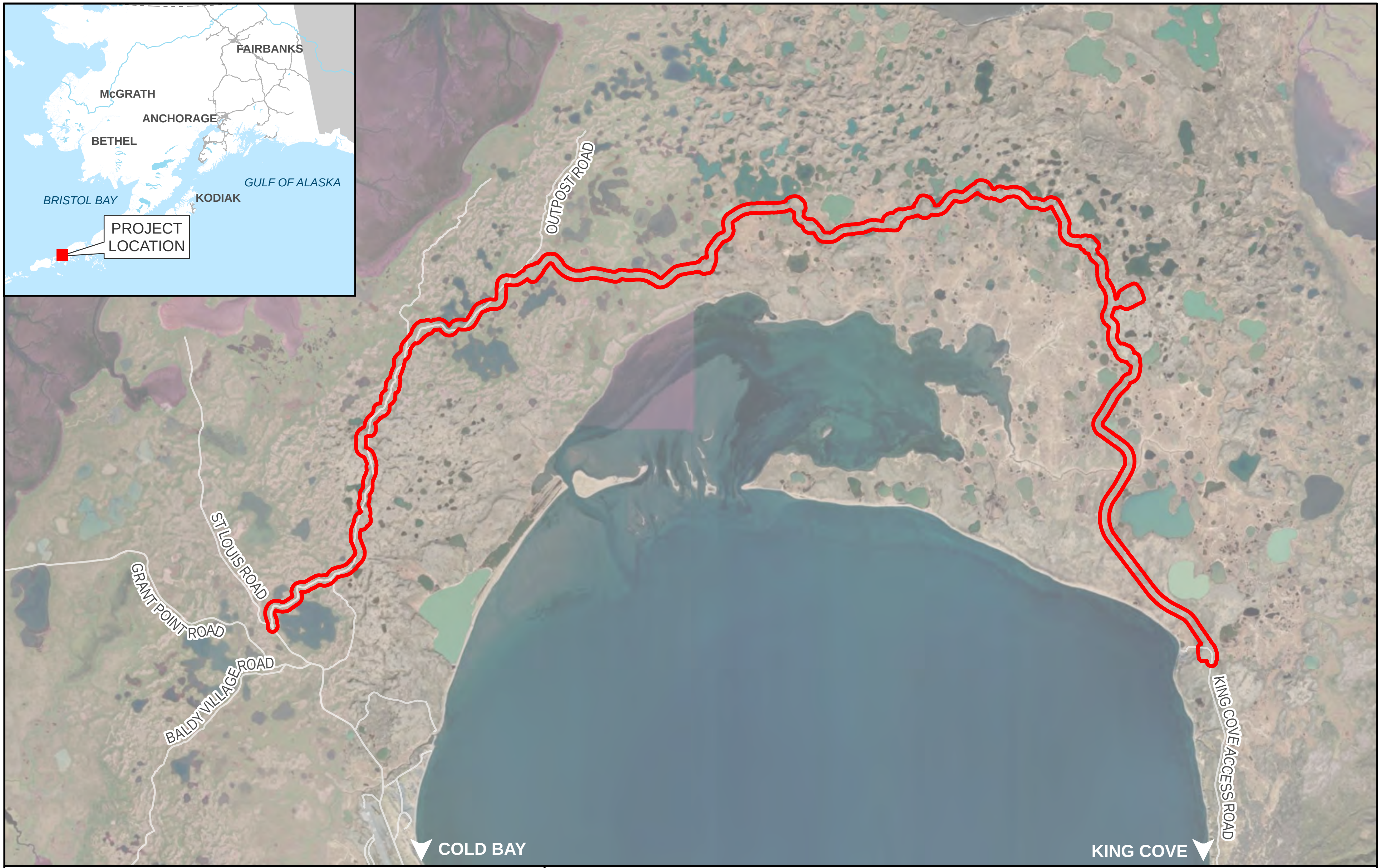

FIGURE 1: Vicinity Map

Applicant: DOT&PF Southcoast Region
Proposed Activity: King Cove to Cold Bay Project

Sheet: 1 of 21

Date: 11/18/2025

POA-2010-00286

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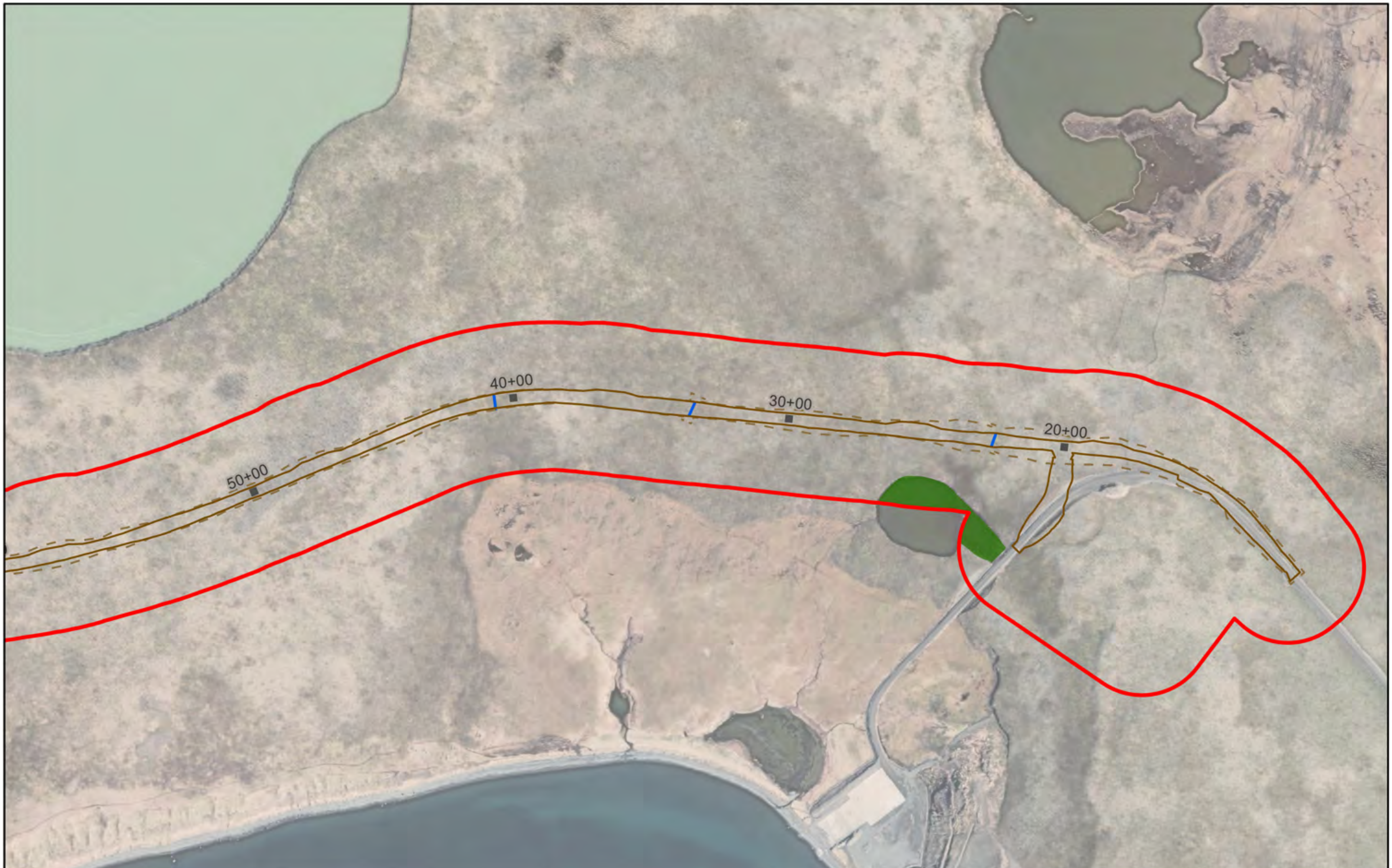

FIGURE 2.1: Plan View

Applicant: DOT&PF Southcoast Region
Proposed Activity: King Cove to Cold Bay Project

Sheet: 2 of 21 POA-2010-00286 Date: 6/24/2026

Project Area
Fill Footprint (06/15/2026)
Fill Footprint (11/18/2025)
DOWL-mapped Wetlands
Proposed Culvert

0 250 500 Feet

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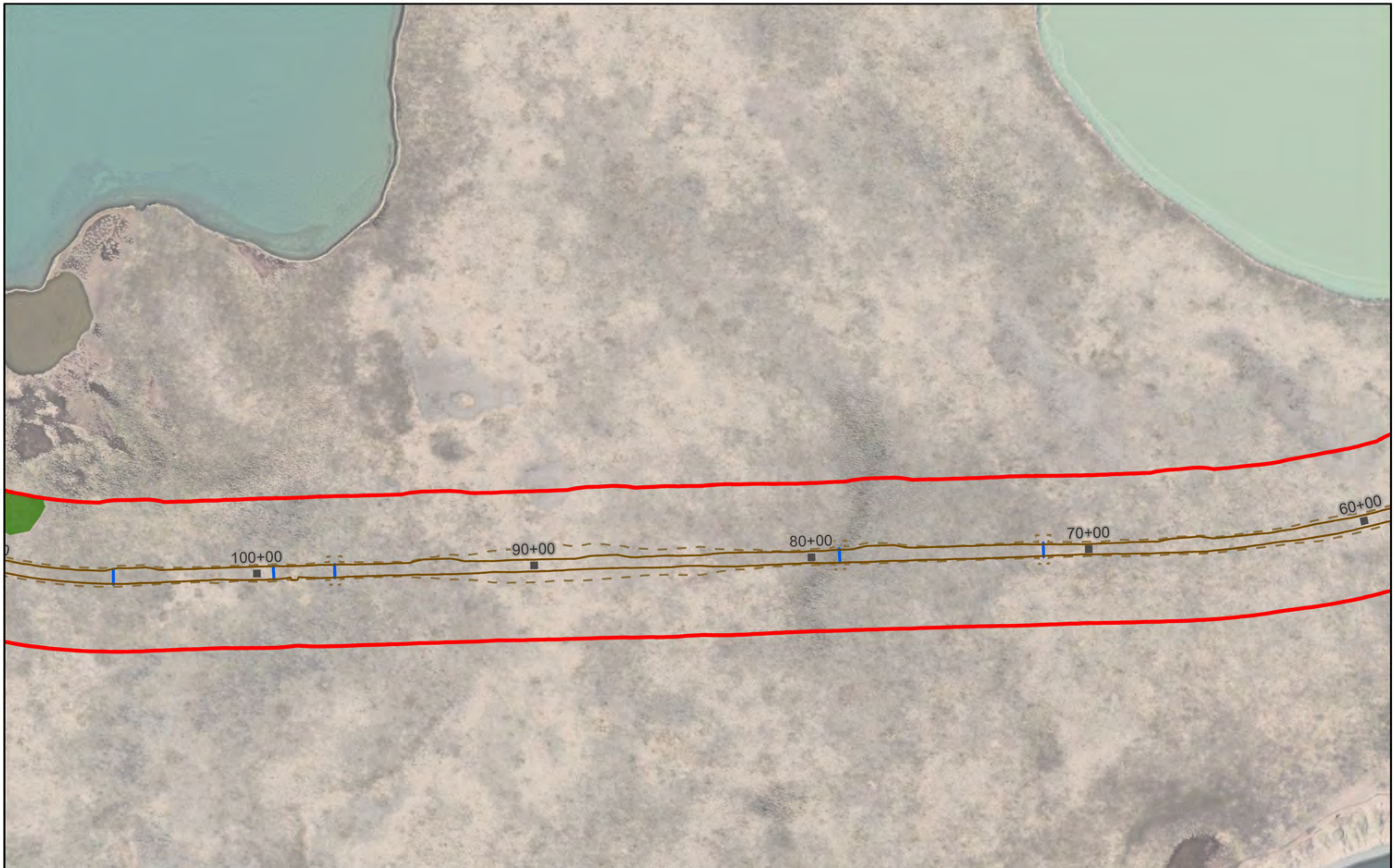


FIGURE 2.2: Plan View

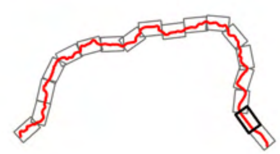
Applicant: DOT&PF Southcoast Region
Proposed Activity: King Cove to Cold Bay Project

Sheet: 3 of 21

POA-2010-00286

Date: 6/24/2026

Project Area
Fill Footprint (06/15/2026)
Fill Footprint (11/18/2025)
DOWL-mapped Wetlands
Proposed Culvert



Feet
0 250 500

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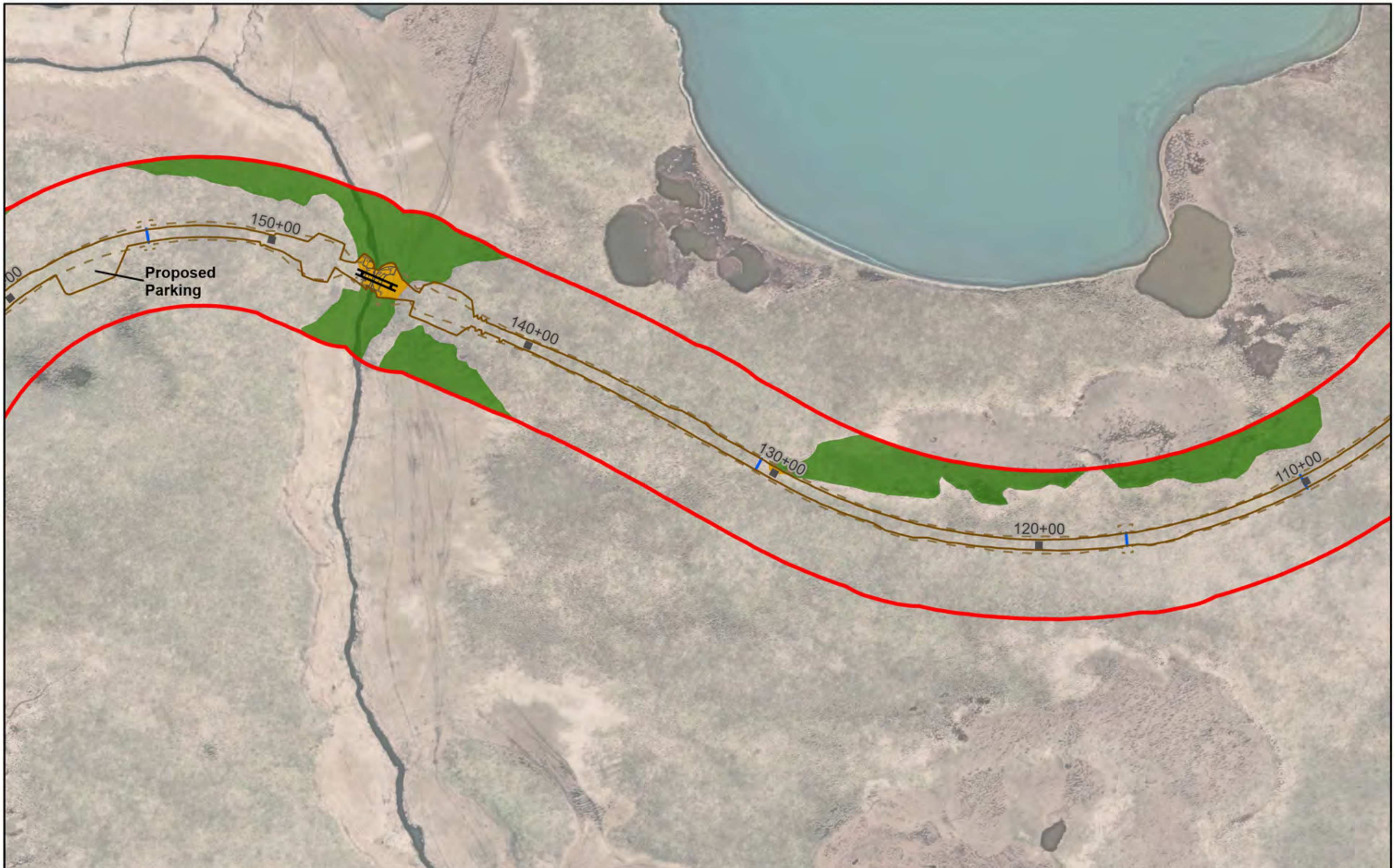

FIGURE 2.3: Plan View

Applicant: DOT&PF Southcoast Region
Proposed Activity: King Cove to Cold Bay Project

POA-2010-00286

Sheet: 4 of 21

Date: 6/24/2026

Project Area
Fill Footprint (06/15/2026)
Fill Footprint (11/18/2025)
Impacted Wetlands
DOWL-mapped Wetlands
Proposed Riprap
Proposed Bridge
Proposed Culvert

Feet
0 250 500

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FIGURE 2.4: Plan View

Applicant: DOT&PF Southcoast Region
Proposed Activity: King Cove to Cold Bay Project

POA-2010-00286

Sheet: 5 of 21

Date: 6/24/2026

Project Area
Fill Footprint (06/15/2026)
Fill Footprint (11/18/2025)
Impacted Wetlands
DOWL-mapped Wetlands

0 250 500 Feet

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FIGURE 2.5: Plan View

Applicant: DOT&PF Southcoast Region
Proposed Activity: King Cove to Cold Bay Project

Sheet: 6 of 21

POA-2010-00286

Date: 6/24/2026

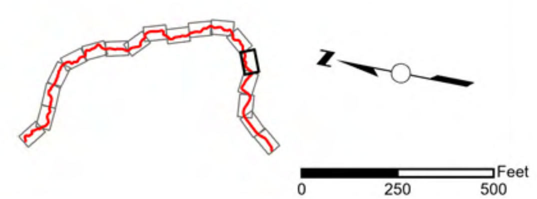

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FIGURE 2.6: Plan View

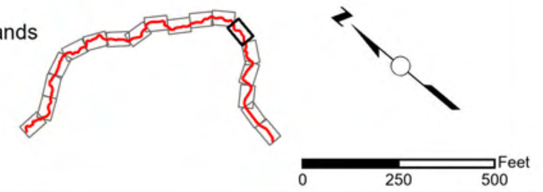
Applicant: DOT&PF Southcoast Region
Proposed Activity: King Cove to Cold Bay Project

Sheet: 7 of 21

POA-2010-00286

Date: 6/24/2026

Project Area
Fill Footprint (06/15/2026)
Fill Footprint (11/18/2025)
Impacted Wetlands
DOWL-mapped Wetlands
Proposed Culvert



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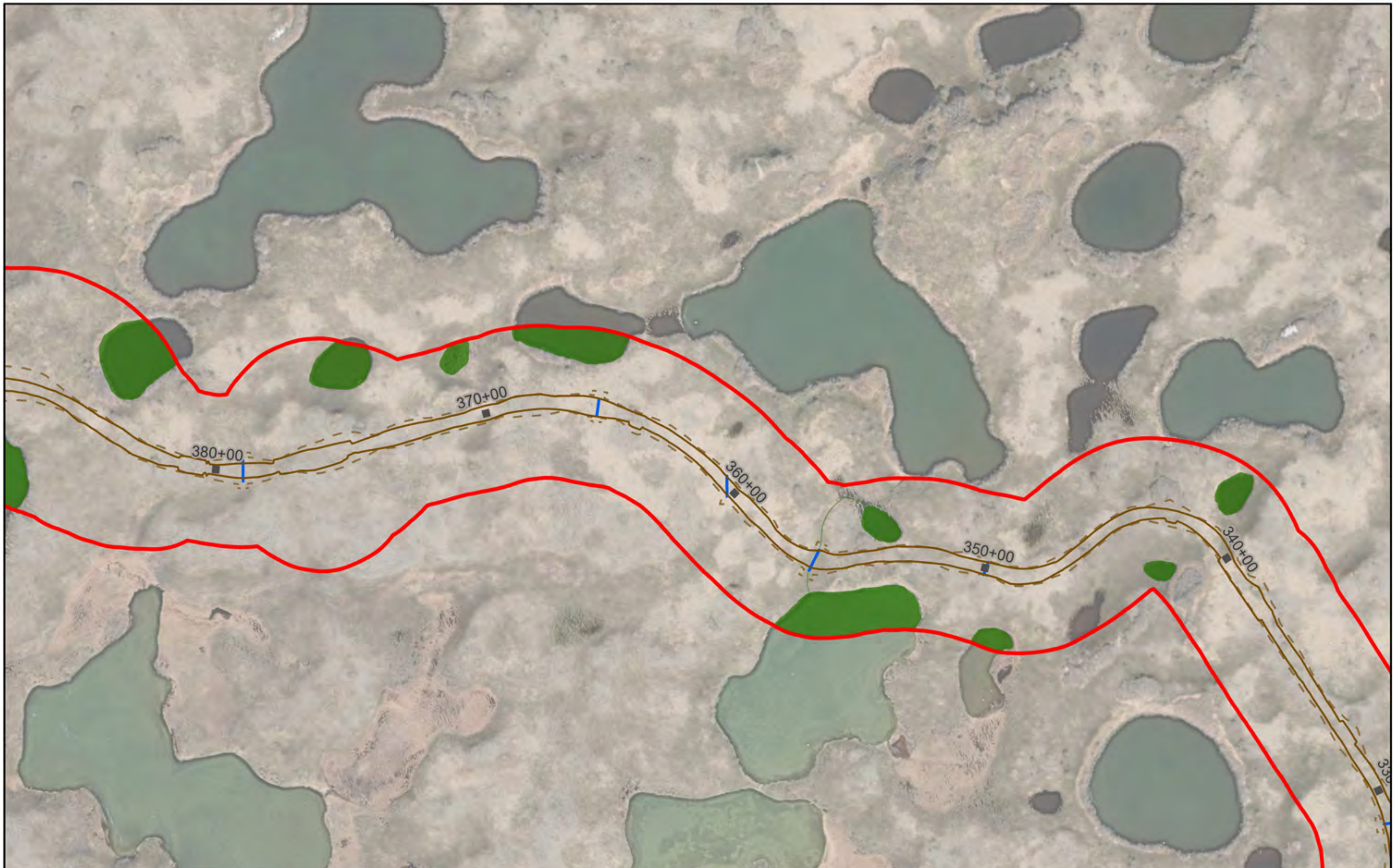

FIGURE 2.7: Plan View

Applicant: DOT&PF Southcoast Region
Proposed Activity: King Cove to Cold Bay Project

Sheet: 8 of 21

POA-2010-00286

Date: 6/24/2026

Project Area
Fill Footprint (06/15/2026)
Fill Footprint (11/18/2025)
Impacted Wetlands
DOWL-mapped Wetlands
Proposed Culvert

0 250 500 Feet

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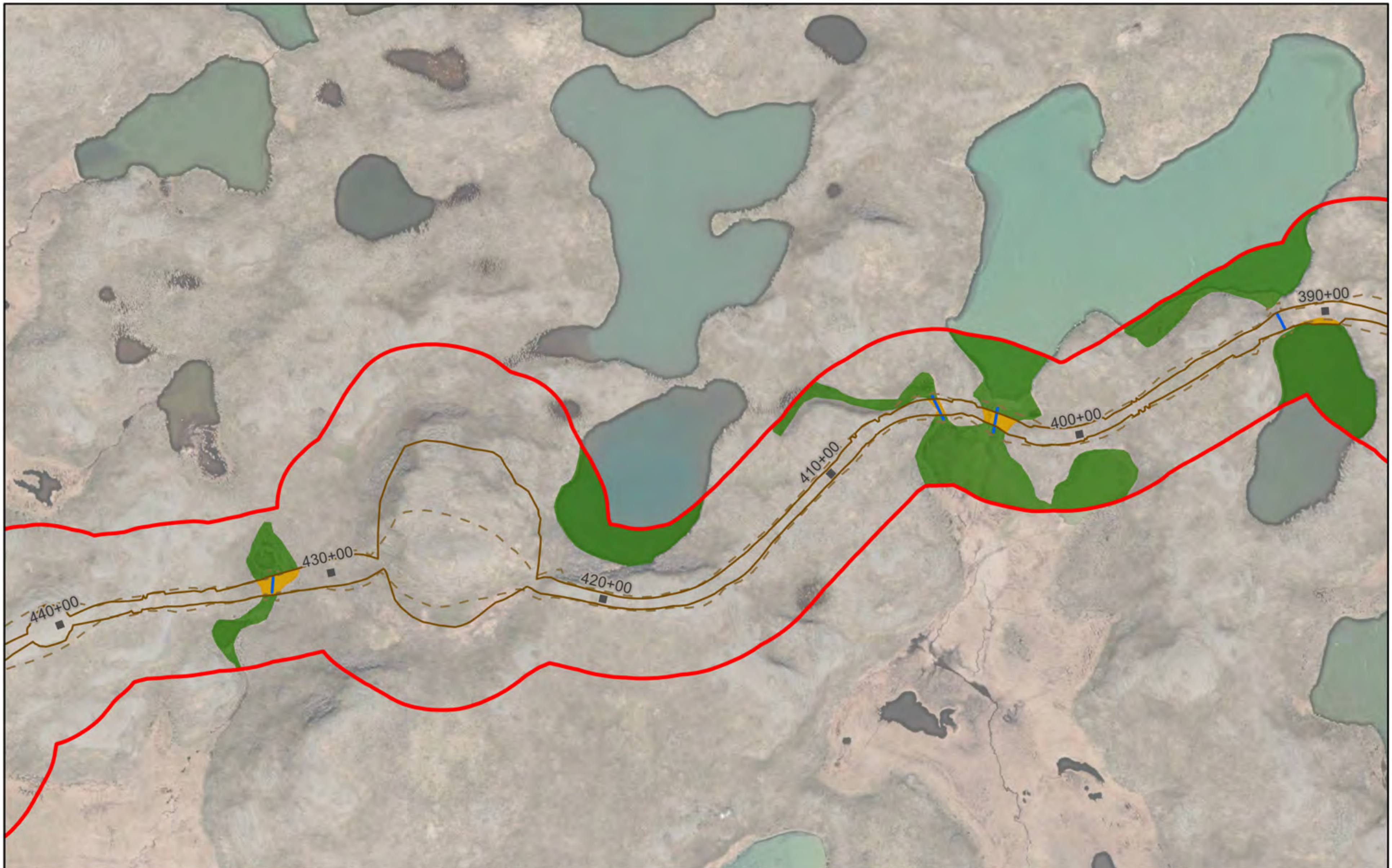


FIGURE 2.8: Plan View

Applicant: DOT&PF Southcoast Region
Proposed Activity: King Cove to Cold Bay Project

Sheet: 9 of 21

POA-2010-00286

Date: 6/24/2026

Project Area
Fill Footprint (06/15/2026)
Fill Footprint (11/18/2025)
Impacted Wetlands
DOWL-mapped Wetlands
Proposed Culvert

N

0 250 500 Feet

J:\50\63353-01\60GIS\Carto\ENV\63353 ENV\63353 ENV.aprx Jun 24, 2026 2:43 PM

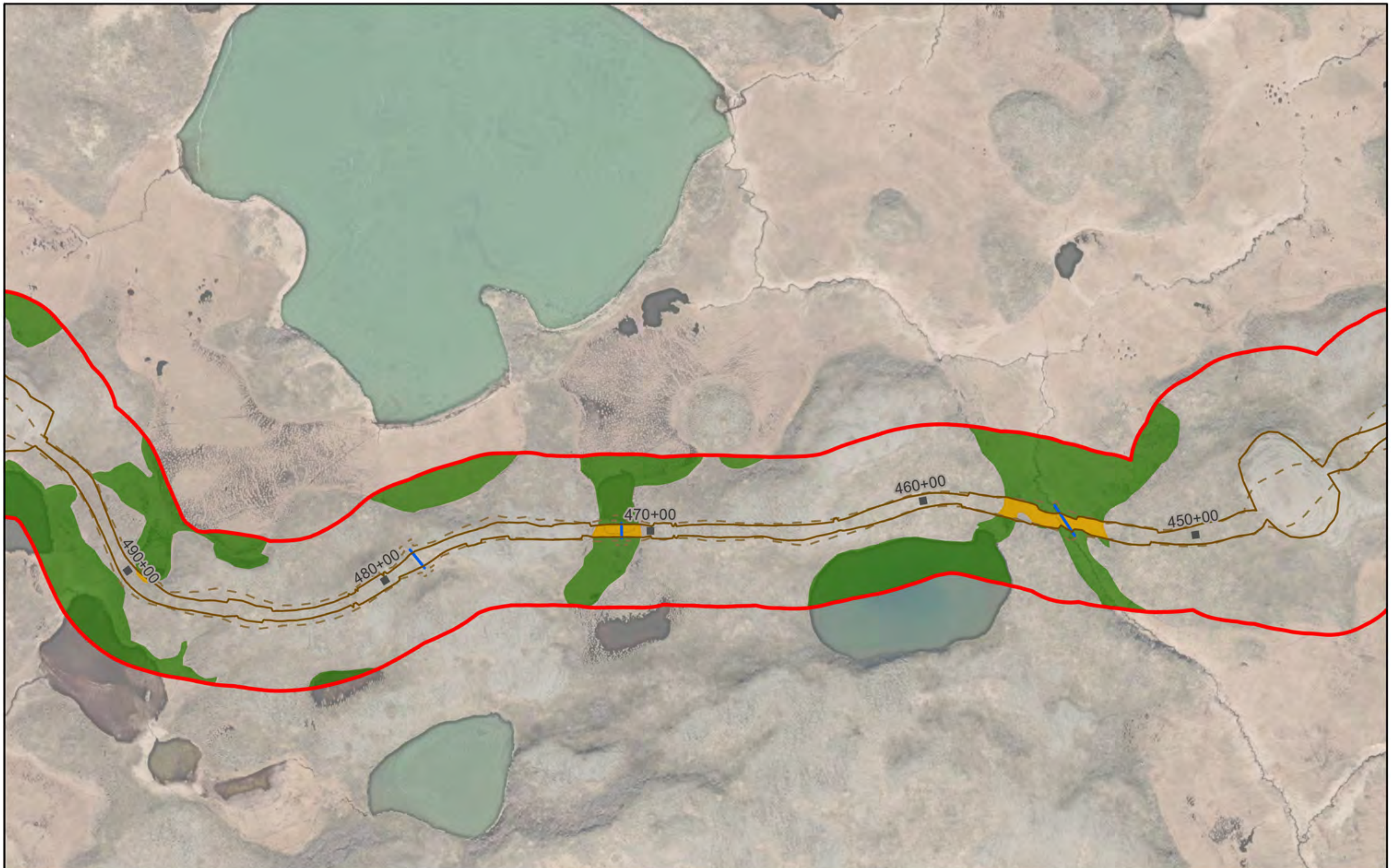


FIGURE 2.9: Plan View

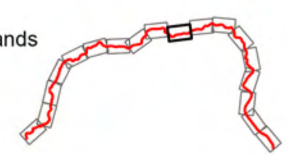
Applicant: DOT&PF Southcoast Region
Proposed Activity: King Cove to Cold Bay Project

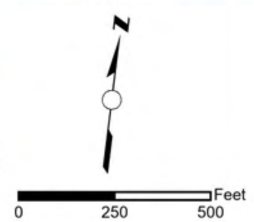
Sheet: 10 of 21

POA-2010-00286

Date: 6/24/2026

Project Area
Fill Footprint (06/15/2026)
Fill Footprint (11/18/2025)
Impacted Wetlands
DOWL-mapped Wetlands
Proposed Culvert





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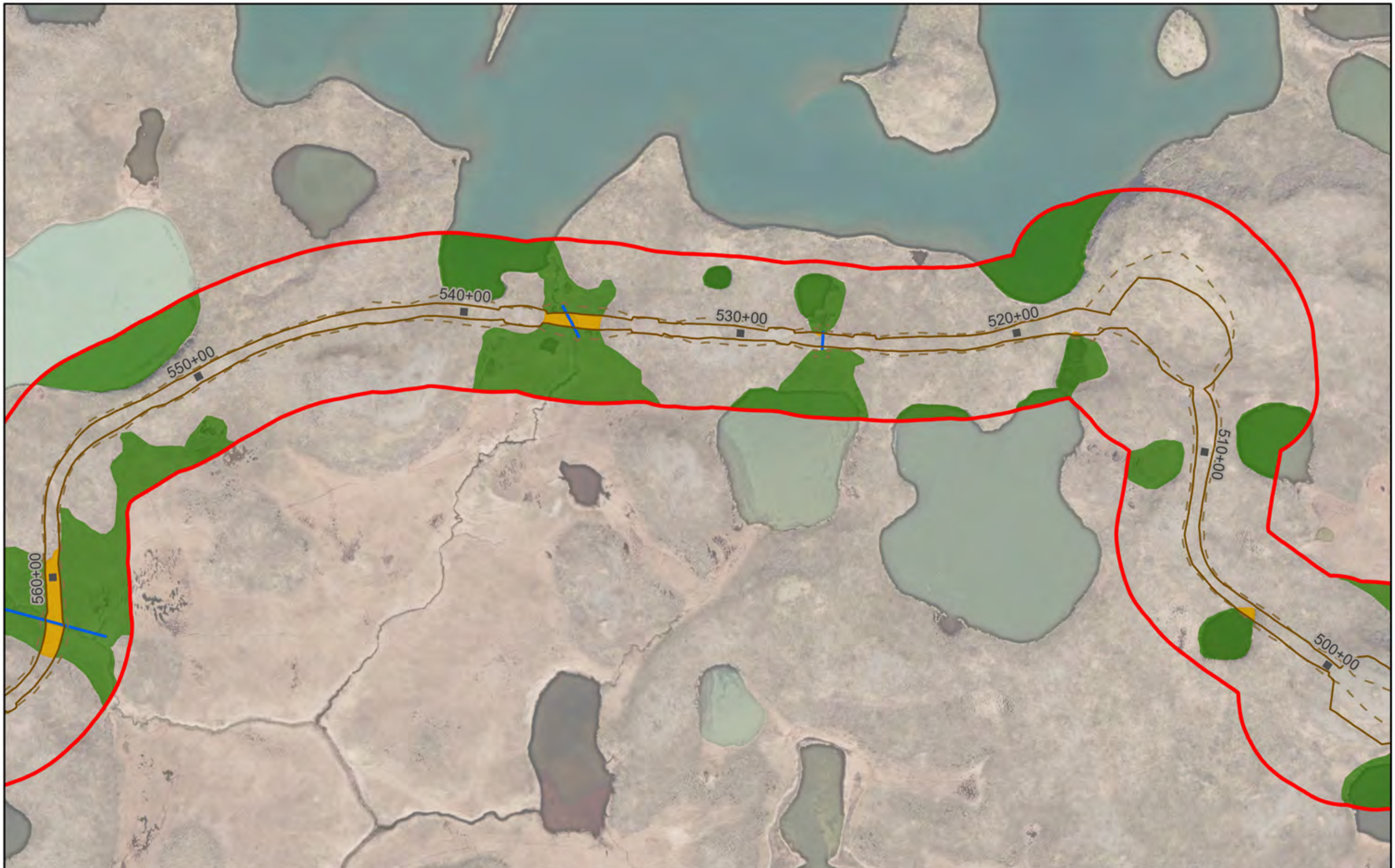

FIGURE 2.10: Plan View

Applicant: DOT&PF Southcoast Region
Proposed Activity: King Cove to Cold Bay Project

Sheet: 11 of 21

POA-2010-00286

Date: 6/24/2026

Project Area
Fill Footprint (06/15/2026)
Fill Footprint (11/18/2025)
Impacted Wetlands
DOWL-mapped Wetlands
Proposed Culvert

N

0 250 500 Feet

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FIGURE 2.11: Plan View

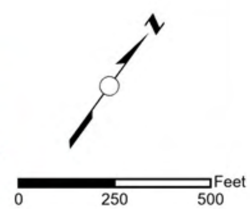
Applicant: DOT&PF Southcoast Region
Proposed Activity: King Cove to Cold Bay Project

Sheet: 12 of 21

POA-2010-00286

Date: 6/24/2026

Project Area
Fill Footprint (06/15/2026)
Fill Footprint (11/18/2025)
Impacted Wetlands
DOWL-mapped Wetlands
Proposed Culvert



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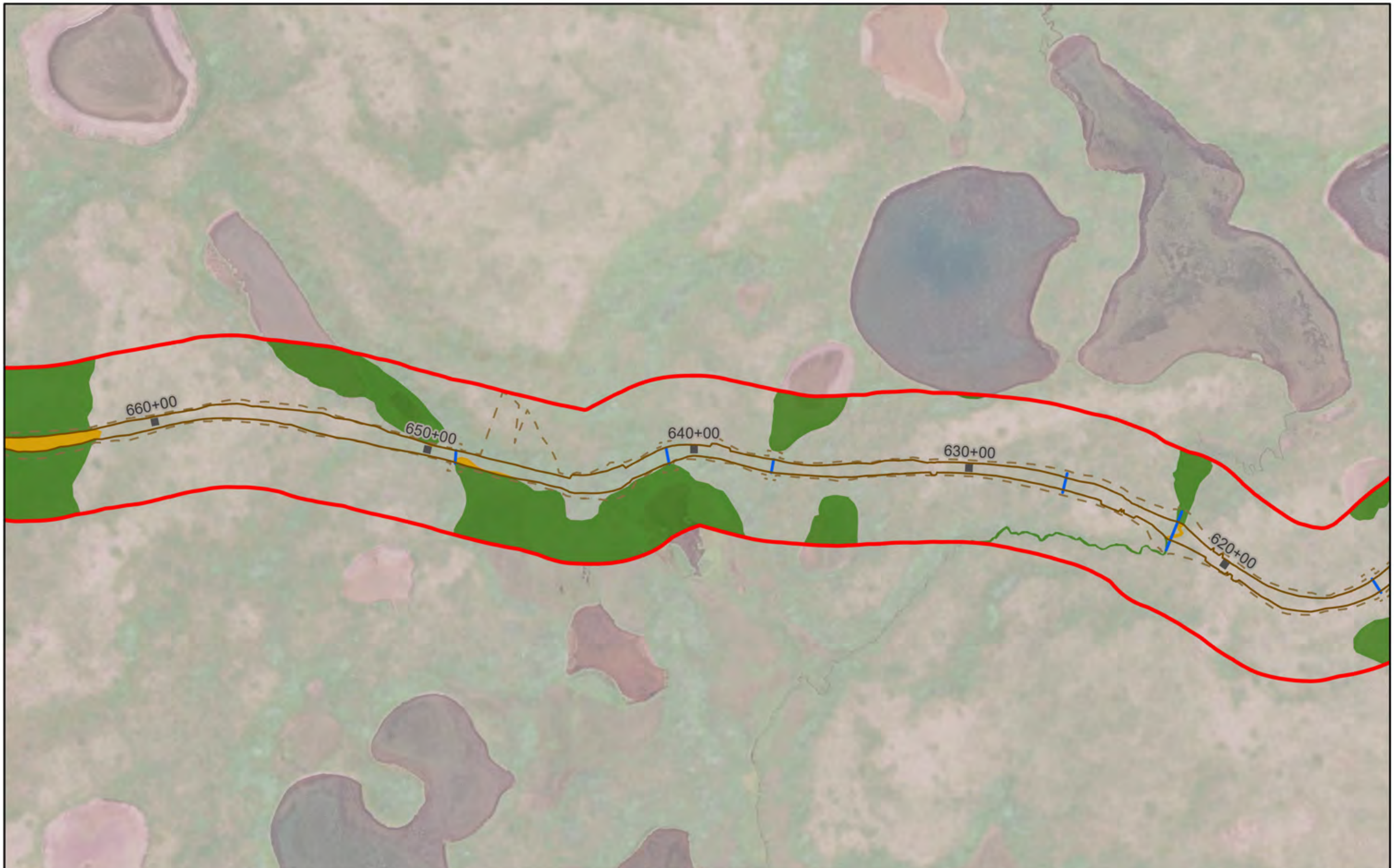

FIGURE 2.12: Plan View

Applicant: DOT&PF Southcoast Region
Proposed Activity: King Cove to Cold Bay Project

Sheet: 13 of 21

POA-2010-00286

Date: 6/24/2026

Project Area
Fill Footprint (06/15/2026)
Fill Footprint (11/18/2025)
Impacted Wetlands
DOWL-mapped Wetlands
Proposed Culvert

N

0 250 500 Feet

J:\50\63353-01\60GIS\Carto\ENV\63353 ENV\63353 ENV.aprx Jun 24, 2026 2:43 PM

FIGURE 2.13: Plan View

Applicant: DOT&PF Southcoast Region
Proposed Activity: King Cove to Cold Bay Project

Sheet: 14 of 21

POA-2010-00286

Date: 6/24/2026

Project Area
Fill Footprint (06/15/2026)
Fill Footprint (11/18/2025)
Impacted Wetlands
DOWL-mapped Wetlands
Proposed Culvert

0 250 500 Feet

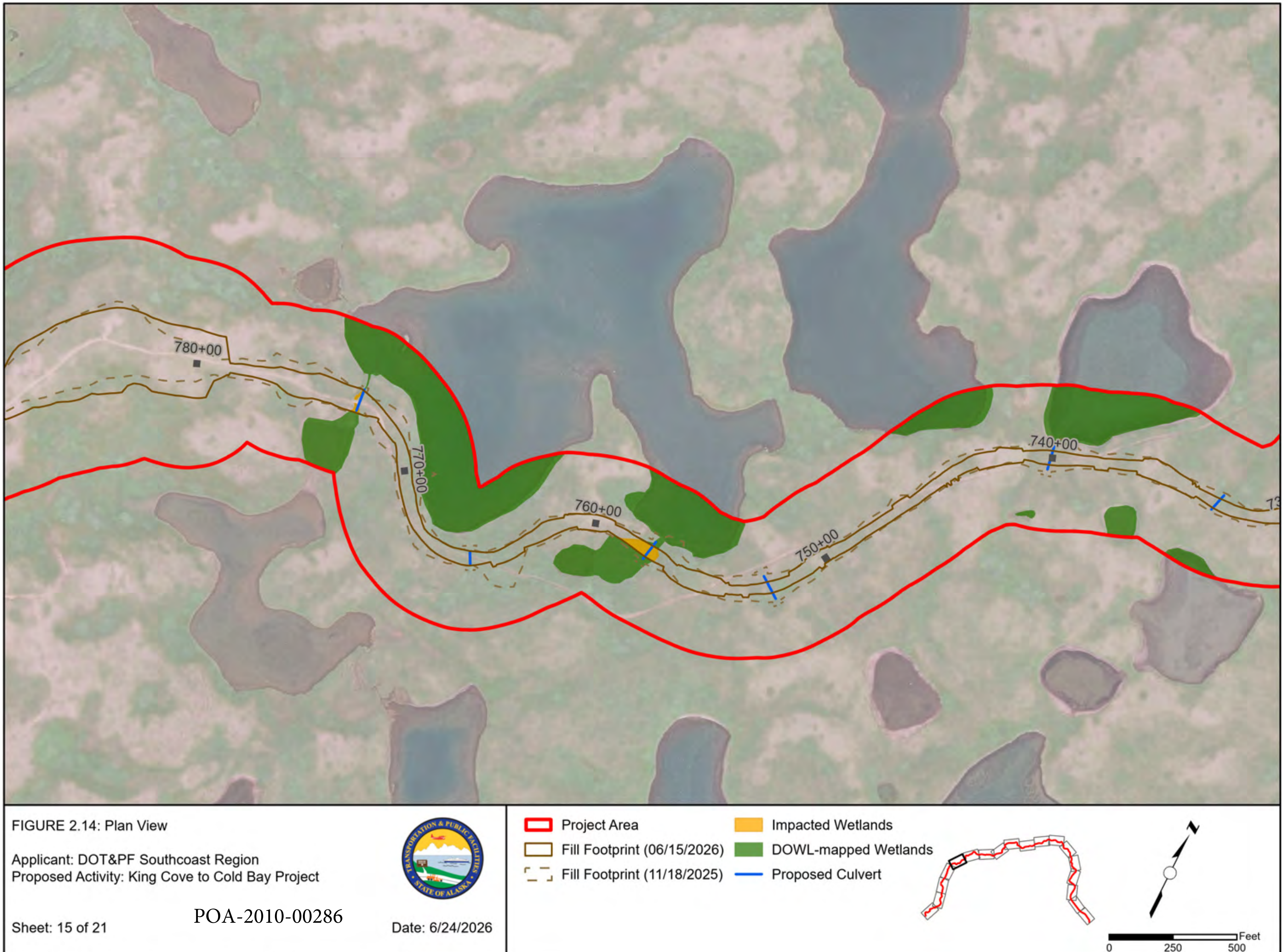

FIGURE 2.14: Plan View

Applicant: DOT&PF Southcoast Region
Proposed Activity: King Cove to Cold Bay Project

Sheet: 15 of 21

POA-2010-00286

Date: 6/24/2026

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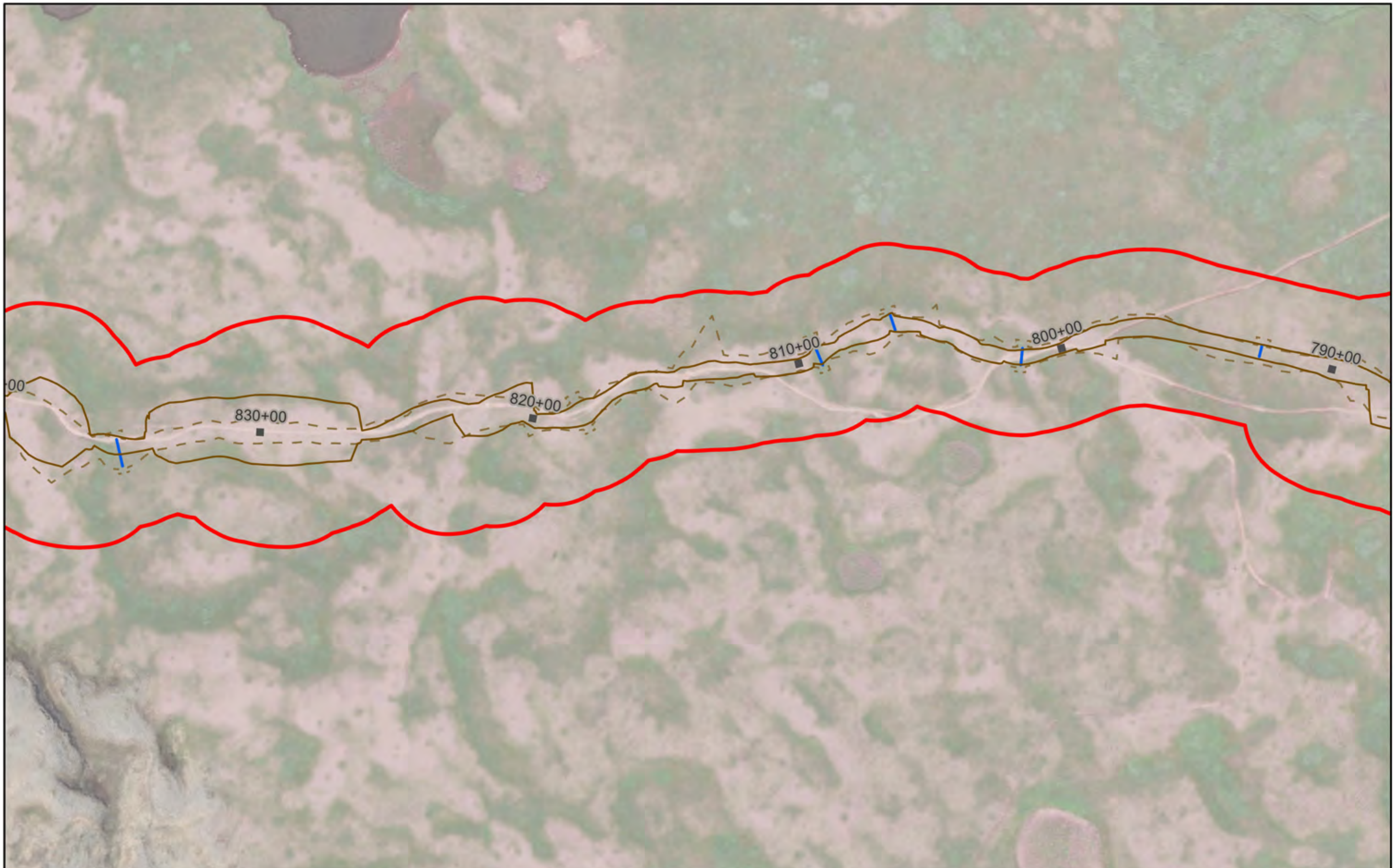

FIGURE 2.15: Plan View

Applicant: DOT&PF Southcoast Region
Proposed Activity: King Cove to Cold Bay Project

Sheet: 16 of 21

POA-2010-00286

Date: 6/24/2026

Project Area
Fill Footprint (06/15/2026)
Fill Footprint (11/18/2025)
Proposed Culvert

Feet
0 250 500

J:\50\63353-01\60GIS\Carto\ENV\63353 ENV\63353 ENV.aprx Jun 24, 2026 2:43 PM

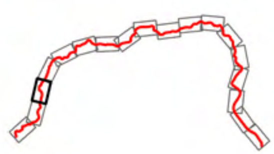

FIGURE 2.16: Plan View

Applicant: DOT&PF Southcoast Region
Proposed Activity: King Cove to Cold Bay Project

Sheet: 17 of 21

POA-2010-00286

Date: 6/24/2026

Project Area
Fill Footprint (06/15/2026)
Fill Footprint (11/18/2025)
DOWL-mapped Wetlands
Proposed Culvert

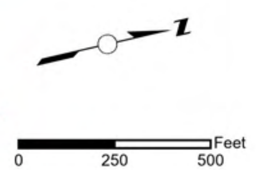

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FIGURE 2.17: Plan View

Applicant: DOT&PF Southcoast Region
Proposed Activity: King Cove to Cold Bay Project

Sheet: 18 of 21

POA-2010-00286

Date: 6/24/2026

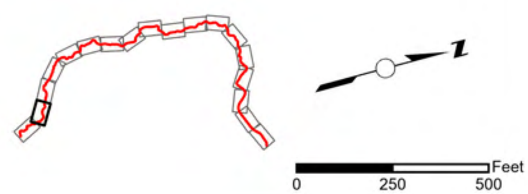

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FIGURE 2.18: Plan View

Applicant: DOT&PF Southcoast Region
Proposed Activity: King Cove to Cold Bay Project

Sheet: 19 of 21

POA-2010-00286

Date: 6/24/2026

Project Area
Fill Footprint (06/15/2026)
Fill Footprint (11/18/2025)
DOWL-mapped Wetlands
Proposed Culvert

Feet
0 250 500

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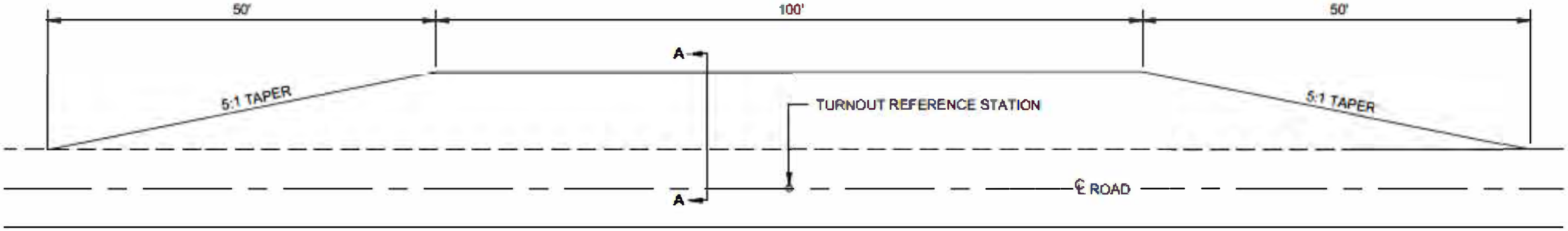
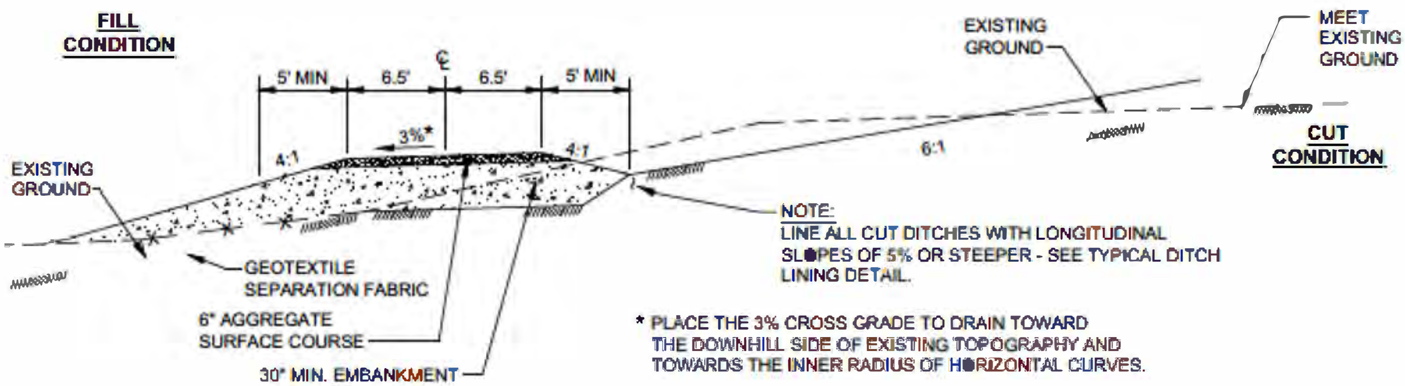
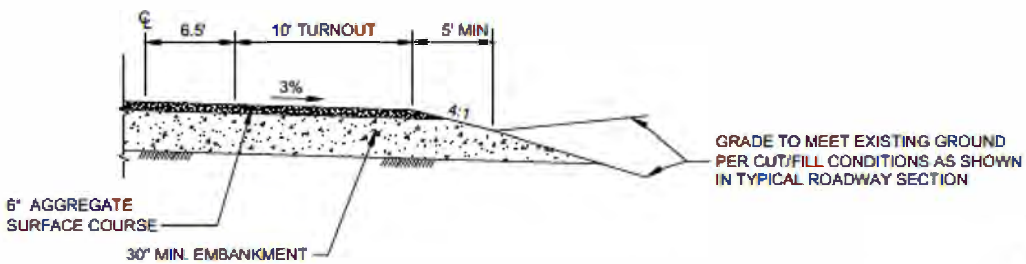


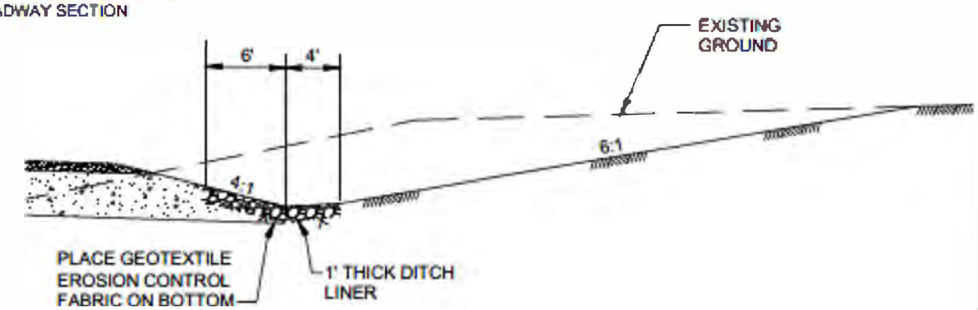
PLAN VIEW



TYPICAL ROADWAY SECTION



TYPICAL ROADWAY TURNOUT DETAIL



TYPICAL DITCH LINING DETAIL

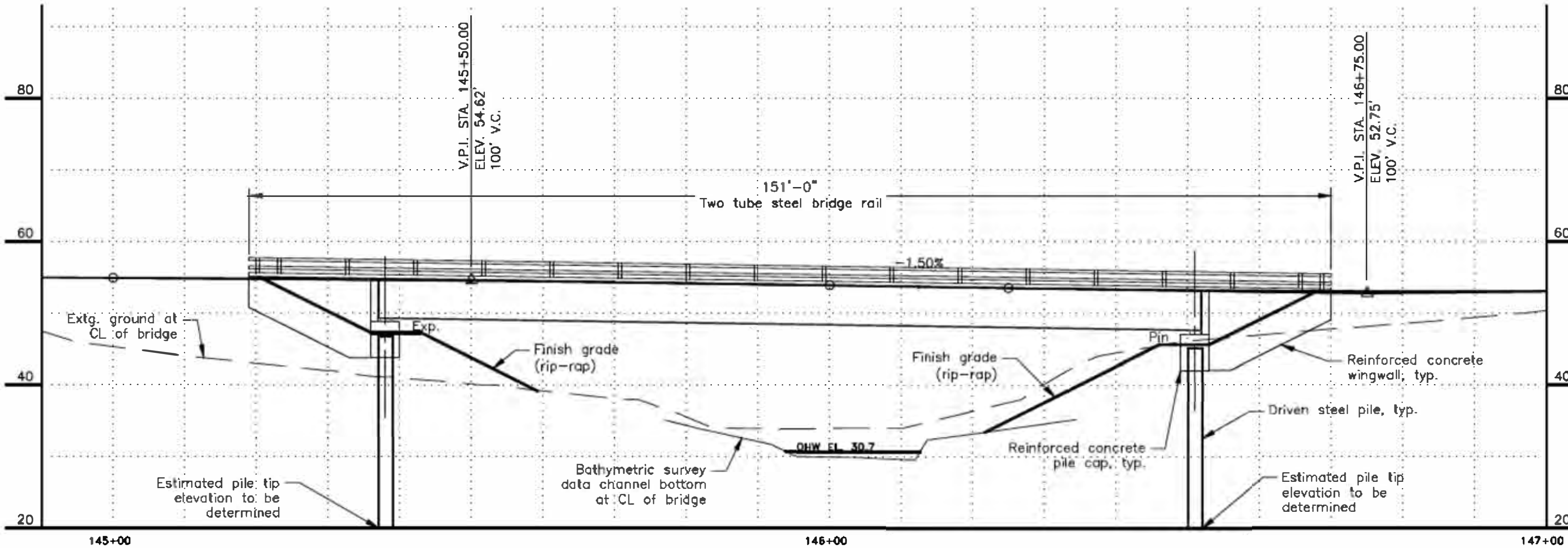
FIGURE 3: Elevation View - Road

Applicant: DOT&PF Southcoast Region
Proposed Activity: King Cove to Cold Bay Project

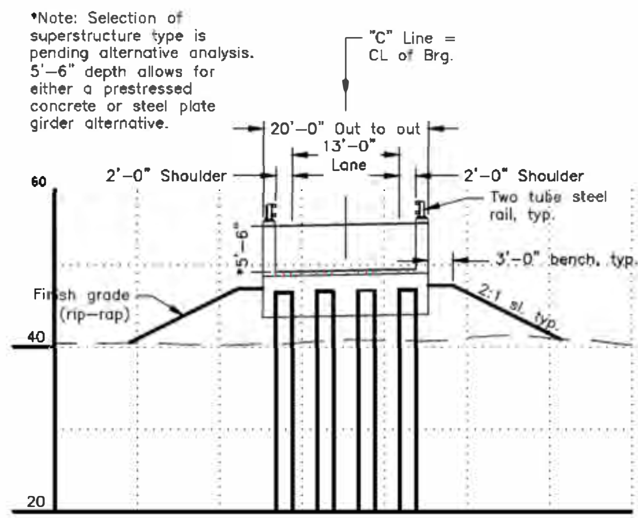
Sheet: 20 of 21

POA-2010-00286

Date: 11/18/2025



BRIDGE SECTION



ABUTMENT SECTION

FIGURE 4: Elevation View - Bridge

Applicant: DOT&PF Southcoast Region
Proposed Activity: King Cove to Cold Bay Project

POA-2010-00286

Date: 11/18/2025

Sheet: 21 of 21

THE STATE of ALASKA
GOVERNOR MIKE DUNLEAVY

Department of Environmental Conservation
DIVISION OF WATER
Wastewater Discharge Authorization Program

555 Cordova Street
Anchorage, Alaska 99501-2617
Main: 907.269.6285
Fax: 907.334.2415
www.dec.alaska.gov/wastewater

July 2, 2026

Alaska Department of Transportation & Public Facilities
Attn: Benjamin Storey, Regional Environmental Manager
PO Box 112506
Juneau, AK 99811

Re: Alaska Department of Transportation & Public Facilities, King Cove - Cold Bay Road
POA-2010-00286 v1.0, Cold Bay

Dear Mr. Storey,

In accordance with Section 401 of the Federal Clean Water Act and provisions of the Alaska Water Quality Standards, the Department of Environmental Conservation (DEC) is issuing the enclosed water quality certification with conditions that the discharge from the proposed project will comply with water quality requirements for dredging and/or fill material in waters of the U.S., authorized by an Army Corps of Engineers (USACE) permit/license POA-2010-00286 - *King Cove - Cold Bay Road* project.

A person authorized under a provision of 18 AAC 15 may request an informal review of a contested decision by the Division Director in accordance with 18 AAC 15.185 and/or an adjudicatory hearing in accordance with 18 AAC 15.195 – 18 AAC 15.340. See DEC's "Appeal a DEC Decision" web page https://dec.alaska.gov/commish/review-guidance/ for access to the required forms and guidance on the appeal process. Please provide a courtesy copy of the adjudicatory hearing request in an electronic format to the parties required to be served under 18 AAC 15.200. Requests must be submitted no later than the deadline specified in 18 AAC 15.

By copy of this letter, we are advising the U.S. Army Corps of Engineers of our actions and enclosing a copy of the certification for their use.

If you have any questions regarding the attached certification, please contact Willow Weimer at 907-269-6096, dec-401cert@alaska.gov.

Sincerely,

N Waldo

Nick Waldo
Program Manager, Storm Water and Wetlands

Enclosure: 401 Water Quality Certificate

cc: (with encl.)
Tyler Riberio, ADOT&PF
John Sargent, USACE John Sargent, USACE
Ken Bouwens, ADF&G;
USFWS Field Office, Anchorage
Matthew LaCroix, EPA AK Operations
ak_fisheries@fws.gov
regpagemaster@usace.army.mil
r10-401-certs@epa.gov

STATE OF ALASKA
DEPARTMENT OF ENVIRONMENTAL CONSERVATION
Water Quality Certification

In accordance with Section 401 of the Federal Clean Water Act (CWA) and the Alaska Water Quality Standards (18 AAC 70), a water quality certification with conditions is issued to the Alaska Department of Transportation & Public Facilities, Attn: Benjamin Storey, PO Box 112506, Juneau AK 99811 for a permit/license to be issued by Army Corps of Engineers (USACE), reference POA-2010-00286 *King Cove - Cold Bay Road.*

Based upon the review of the federal application, readily available water quality-related materials, and certification request[1] in accordance with the CWA § 121.5(b) and (c), and 121.7 (c), DEC certifies that if the permittee complies with the terms and conditions imposed by the permit and the conditions set forth in this water quality certification, then it is reasonable for DEC to conclude that the activity will comply with water quality requirements, including applicable requirements of the CWA §§ 301, 302, 303, 306, and 307, Alaska's Water Quality Standards (WQS, 18 AAC 70) and other appropriate water quality requirements of state law.

The scope of certification is limited to the water quality-related impacts of the activity subject to the Federal license or permit (40 CFR 121.3, 18 AAC 15.180). Public notice of the application for this certification was given as required by 18 AAC 15.180 in the DEC Public Notice POA-2010-00286 posted from March 3 to March 23, 2026. Two comment letters were received and area addressed in the attached Response To Comments.

Project Purpose, Description, and Location

Project Name: King Cove - Cold Bay Road

Dates of the proposed activity are planned to begin and end: 04/01/2026 to 12/31/2027

Location: The proposed activity is located within Section 17, T. 057S, R. 087W, Seward Meridian, in Aleutians East Borough, Alaska. Project Site (Latitude, Longitude): 55.249480, -162.50551. With potential discharge location(s) as follows: 55.25032, -162.50510.

Purpose: The purpose and need for this project is to provide the residents and businesses of the community of King Cove with safe, reliable, and affordable surface transportation to the State of Alaska's all-weather airport at Cold Bay.

An estimated 300,000 cubic yards of fill will be discharged into an estimated 8.9 Acres of waters of the United States (WOTUS).

Description: The proposed project is to construct a 19-mile-long, single-lane, unpaved road owned by King Cove Corporation, connecting the community of King Cove to the road system and to the all-weather airport at Cold Bay. The proposed project will discharge fill and mechanically clear wetlands and other waters to construct the roadway. The project would require 63 culverted stream crossings (some containing anadromous salmon), one bridge, and the development of 2 dedicated material sites. Approximately 8.9 acres of freshwater wetlands would be filled with 60,000 cubic yards of gravel material

---

for the road embankment. Sources of gravel for road construction would be obtained from material sites located in uplands at 2 dedicated material sites and from several other locations along the road corridor.

Additional Information: Permits from local and state agencies would include Alaska Department of Fish and Game Fish Habitat Permit and APDES Coverage under the Construction General Permit with a Stormwater Pollution Prevention Plan (SWPPP).

Applicant Proposed Mitigation: The applicant proposes the following mitigation measures to avoid, minimize, and compensate for impacts to waters of the United States from activities involving discharges of dredged or fill material.

a. Avoidance: Complete avoidance of waters of the United States by the road was viewed by the applicant as not possible due to the abundance and distribution of wetlands along the existing King Cove Corporation (KCC) owned road corridor. The project will avoid releases of sediment and erosion through the application of BMP's throughout construction.

b. Minimization: The project has been designed to minimize the discharge of fill into wetlands and other aquatic resources by the following means.

    a. The road corridor would connect to existing roadways and trails.

    b. The proposed road would be located to follow upland ridges wherever possible to minimize siting within wetlands.

    c. The design would incorporate 4:1 side slopes, where practicable, for slope stability, traffic safety, and to minimize impacts to wetlands and other waters.

    d. Material sites are planned to be in the uplands.

    e. Existing drainage patterns would be maintained to the greatest extent practicable.

    f. Properly sized and designed culverts would be installed to maintain the natural flow patterns of surface waters to adjacent wetlands and waters. Where fish are present, stream crossings would be designed to enable the passage of fish, including anadromous salmon. The stream bed and banks would be backfilled and restored to approximate pre-existing conditions, as much as practicable.

    g. To the extent practicable, staging areas and other work areas would be located in uplands at least 50 feet away from wetlands and other waters. Project limits in waters of the U.S. would be clearly identified in the field prior to vegetation clearing and construction. Equipment would remain inside the identified project limits and would not be stored, maintained, or repaired in waters of the U.S.

    h. Best management practices during construction would be followed to protect water quality, wetlands, and waterways from excessive siltation and sedimentation.

    i. The proposed project has been sited to avoid wetland areas, lowlands, and other areas that could be impacted by sedimentation.

    j. BMP's will be employed during construction to minimize the severity of stormwater discharges.

c. Mitigation: The Alaska Department of Transportation and Public Works has developed the proposed project in coordination with State, Borough and city government entities that represent the private landowners in the community of King Cove. Many of those landowners are also shareholders of the King Cove Corporation (KCC) which previously owned land in the vicinity of Kinzarof Lagoon known colloquially as the "bookends". In October 2025, the U.S. Department of Interior entered into a land exchange agreement to convey approximately 490 acres of the Izembek National Wildlife Refuge to the KCC for a single lane gravel road (the subject of this application) in exchange for approximately 1,739 acres of land in the vicinity of Kinzarof Lagoon ("the bookends"). The applicant is proposing that the 1,739-acre "bookends" be considered as compensatory mitigation for the unavoidable loss of 8.9 acres of wetlands associated with the project. The KCC also relinquished its selection rights under the Alaska Native Claims Settlement Act to 5,430 acres of land within the Izembek Refuge, and these lands are also proposed in the applicant's proposed compensatory mitigation.

Antidegradation Analysis Finding

Pursuant to the Department's Antidegradation Policy and Implementation Methods at 18 AAC 70.015 and 18 AAC 70.016, DEC finds that the project would comply with the requirements for Tiers 1 and 2 regarding water quality impacts to receiving water immediately surrounding the dredge or fill material pursuant to the Corps evaluation and findings of no significant degradation under 33 U.S.C. 1344 and under 40 CFR 230. The use of appropriate best management practices and erosion and sediment control measures would adequately protect the existing water uses and the level of water quality necessary to protect existing uses. Any potential water quality degradation is expected to be temporary, limited, and necessary to accommodate important social and/or economic development in the area.

Conditions Necessary to Ensure Compliance with Water Quality Standards or Other Appropriate Water Quality Requirements of State Law

The Department of Environmental Conservation (DEC) reviewed the application and certifies that there is reasonable assurance that the proposed activity, as well as any discharge that may result, will comply with applicable provisions of Section 401 of the CWA and the Alaska Water Quality Standards (18 AAC 70) provided the permittee complies with the terms and conditions imposed by the permit/license and that the following additional measures are adhered to.

Pursuant to 18 AAC 70.020(a) and the Toxics and Other Deleterious Organic and Inorganic Substances in 18 AAC 70.020(b), the following conditions are designed to reduce pollutants from construction activity to ensure compliance with the applicable water quality standards.

Pollutants/Toxics

1. Fuel storage and handling activities for equipment must be sited and conducted so there is no petroleum contamination of the ground, subsurface, or surface water bodies.

2. During construction, spill response equipment and supplies such as sorbent pads shall be available and used immediately to contain and clean up oil, fuel, hydraulic fluid, antifreeze, or other pollutant spills. Any spill amount must be reported in accordance with Discharge Notification and Reporting Requirements (AS 46.03.755 and 18 AAC 75 Article 3). The applicant must report the spill to the DEC Area Response Team office online at https://reportspills.alaska.gov/ or via phone: at 1-800-478-9300 or 1-907-269-0667. For Federal reporting requirements, see the National Response Center website: https://nrc.uscg.mil/. For more information, see the DEC Spill Information website: https://dec.alaska.gov/spar/ppr/spill-information/reporting/.
3. Construction equipment shall not be operated below the ordinary high-water mark if the equipment is leaking fuel, oil, hydraulic fluid, or any other hazardous material. Equipment shall be inspected daily for leaks. If leaks are found, the equipment shall not be used and pulled from service until the leak is repaired.
4. Fill material (including dredge material) must be clean soil, sand, gravel, or rock, free from petroleum products and toxic contaminants in toxic amounts.

Turbidity, Erosion, and Sediment Control

5. Runoff discharged to surface water (including wetlands) from a construction site disturbing one or more acres must be covered under Alaska's General Permit for Storm Water Discharges from Large and Small Construction Activities in Alaska (CGP, AKR100000, 18 AAC 83). The CGP requires the development and implementation of a Storm Water Pollution Prevention Plan (SWPPP). For projects that disturb more than five acres, this SWPPP must also be submitted to DEC prior to construction, along with the Notice of Intent (NOI). For more information see DEC's website for the CGP at https://dec.alaska.gov/water/wastewater/stormwater/construction, or call 907-269-6285.
6. Excavated or fill material, including overburden, shall be placed so that it is stable, meaning after placement, the material does not show signs of excessive erosion. Indicators of excess erosion include gullying, head cutting, caving, block slippage, material sloughing, etc. The material must be contained with siltation best management practices (BMPs) to preclude reentry into any waters of the U.S., which includes wetlands.
7. Before fill placement in the spring or summer, a silt fence or similar structure shall be installed on a line parallel to and within five feet of the proposed fill toe of slope within all wetland areas that contain standing water that is connected to any natural body of water or where the fill toe is within 25 feet of such a water body. This structure shall remain in place until the fill has been stabilized or contained in another manner.
8. Include the following BMPs to handle stormwater and total stormwater volume discharges as they apply to the site:
    a. Divert stormwater from off-site around the site so that it does not flow onto the project site and cause erosion of exposed soils.
    b. Slow down or contain stormwater that may collect and concentrate within a site and cause erosion of exposed soils.

c. Place velocity dissipation devices (e.g., check dams, sediment traps, or riprap) along the length of any conveyance channel to provide a non-erosive flow velocity. Also, place velocity dissipation devices where discharges from the conveyance channel or structure join a watercourse to prevent erosion and to protect the channel embankment, outlet, adjacent stream bank slopes, and downstream waters.

Vegetation Protection and Restoration

9. Any disturbed ground and exposed soil not covered with fill must be stabilized and re-vegetated with endemic species, grasses, or other suitable vegetation appropriately to minimize erosion and sedimentation, so that a durable vegetative cover is established promptly.
10. All work areas, material access routes, and surrounding wetlands involved in the construction project shall be delineated and marked in such a way that equipment operators do not operate outside of the marked areas.
11. Natural drainage patterns shall be maintained, to the extent practicable, without introducing ponding or drying.
12. The project must include features to discourage, reduce, or impair unauthorized offroad vehicle access to protected lands in the Izembek National Wildlife Refuge.

General

13. DEC coordinates with several regulatory programs to review the impacts of proposed projects. A Section 401 Certification does not release the applicant from obtaining all necessary federal, state, and local permits, nor does it limit more restrictive requirements set through any such program. It does not eliminate, waive, or vary the applicant's obligation to comply with all state water statutes and rules through the construction, installation, and operation of the project or mitigation, including, but not limited to, the APDES permitting program 18 AAC 83 and 18 AAC 72.
14. USACE has stated that projects shall be reviewed under the federal rules in place at the time the application is received. This project and its mitigation were reviewed under the federal and state statutes and laws in place at the time the application was received. If the USACE determines any part or condition of this Certification is not lawful or is waived and unenforceable, the determination shall apply only to the part or condition so determined. The determination shall not apply to or invalidate any remaining parts or conditions of this Certification. If the USACE makes such a determination, the applicant remains responsible for meeting state water quality statutes and rules, and if a violation occurs, may be subject to state enforcement (18 AAC 70.010).
15. This Certification does not release the applicant from any liability, penalty, or duty imposed by Alaska or federal statutes, regulations, rules, or local ordinances, and it does not convey property rights or an exclusive privilege.
16. No construction will occur in the vicinity of the historic live fire range (between the bridge site shown on Figure 2.3 of the Project Figures and the western end of the project) until unexploded ordinance (UXO) clearance activities are conducted within the work area and a UXO safety plan is implemented.

17. If the project is not completed within the timeframe specified in the applicable USACE permit and is expected to continue, or if a modification to the USACE permit is sought that requires a new Public Notice, an application to renew this certification shall be submitted. The renewal application must be received at least 60 days before the modification is needed to allow time for the public process described in 18 AAC 15.120(b), 18 AAC 15.130, and 18 AAC 15.180.

Date: July 2, 2026

N Waldo

Nick Waldo, Program Manager
Storm Water and Wetlands

United States Department of the Interior

U.S. FISH AND WILDLIFE SERVICE
Southern Alaska Fish and Wildlife Field Office
4700 BLM Road
Anchorage, Alaska 99507

In Reply refer to:
FWS/R7/SAFWFO/2026-0057356

John Sargent
Project Manager, Regulatory Division
United States Army Corps of Engineers
1046 Marks Road
Fort Wainwright, Alaska 99703

Subject: Endangered Species Act Formal Consultation on U.S. Army Corps of Engineers Permit for King Cove to Cold Bay (Izembek) Access Road, POA-2010-00286 (Service File Number 2026-0057356)

Dear John Sargent:

This letter transmits the U.S. Fish and Wildlife Service's (Service) biological opinion based on our review of the of the proposed issuance of a permit pursuant to section 404 of the Clean Water Act for construction of a proposed road from King Cove to Cold Bay and its effects on the threatened Alaska-breeding population of Steller's eiders (*Polysticta stelleri*), the threatened southwest Alaska Distinct Population Segment (DPS) of northern sea otter (*Enhydra lutris kenyonii*), and designated critical habitat for the Alaska-breeding population of Steller's eider and southwest Alaska DPS of northern sea otter, in accordance with section 7 of the Endangered Species Act of 1973, as amended (16 U.S.C. 1531 *et seq*., ESA). We received your request for formal consultation on March 9, 2026, and revised biological assessment on March 23, 2026. We received an addendum to the biological assessment on May 11, 2026. You have also determined the action will have no effect on the federally endangered short-tailed albatross (*Phoebastria albatrus*). We have reviewed this no effect determination and adopt it as part of our analysis of the proposed action in this biological opinion.

We have based the attached biological opinion on the best available scientific and commercial information from a variety of sources including the March 23, 2026, Biological Assessment (including subsequent amendments), the November 2024 draft Supplemental Environmental Impact Statement, the 2013 Final Environmental Impact Statement and Record of Decision, the Compensatory Mitigation Plan, Microsoft Teams and telephone conversations, emails, peer-reviewed publications, unpublished reports available through the Service, and other sources of information cited in the biological opinion. A complete record of this consultation is on file at the Southern Alaska Fish and Wildlife Field Office in Anchorage, Alaska.

NOTIFICATION OF ADMINISTRATIVE APPEAL OPTIONS AND PROCESS AND REQUEST FOR APPEAL			
Applicant: Mr. Benjamin Storey, Alaska DOT and Public Facilities		File Number: POA-2010-00286	Date: July 8, 2026
Attached is:			See Section Below
X	INITIAL PROFFERED PERMIT (Standard Permit or Letter of permission)		A
	PROFFERED PERMIT (Standard Permit or Letter of permission)		B
	PERMIT DENIAL		C
	APPROVED JURISDICTIONAL DETERMINATION		D
	PRELIMINARY JURISDICTIONAL DETERMINATION		E

SECTION I - The following identifies your rights and options regarding an administrative appeal of the above decision. Additional information may be found at http://www.usace.army.mil/CECW/Pages/reg_materials.aspx or Corps regulations at 33 CFR Part 331.

A: INITIAL PROFFERED PERMIT: You may accept or object to the permit.

- ACCEPT: If you received a Standard Permit, you may sign the permit document and return it to the district engineer for final authorization. If you received a Letter of Permission (LOP), you may accept the LOP and your work is authorized. Your signature on the Standard Permit or acceptance of the LOP means that you accept the permit in its entirety, and waive all rights to appeal the permit, including its terms and conditions, and approved jurisdictional determinations associated with the permit.

- OBJECT: If you object to the permit (Standard or LOP) because of certain terms and conditions therein, you may request that the permit be modified accordingly. You must complete Section II of this form and return the form to the district engineer. Your objections must be received by the district engineer within 60 days of the date of this notice, or you will forfeit your right to appeal the permit in the future. Upon receipt of your letter, the district engineer will evaluate your objections and may: (a) modify the permit to address all of your concerns, (b) modify the permit to address some of your objections, or (c) not modify the permit having determined that the permit should be issued as previously written. After evaluating your objections, the district engineer will send you a proffered permit for your reconsideration, as indicated in Section B below.

B: PROFFERED PERMIT: You may accept or appeal the permit

- ACCEPT: If you received a Standard Permit, you may sign the permit document and return it to the district engineer for final authorization. If you received a Letter of Permission (LOP), you may accept the LOP and your work is authorized. Your signature on the Standard Permit or acceptance of the LOP means that you accept the permit in its entirety, and waive all rights to appeal the permit, including its terms and conditions, and approved jurisdictional determinations associated with the permit.

- APPEAL: If you choose to decline the proffered permit (Standard or LOP) because of certain terms and conditions therein, you may appeal the declined permit under the Corps of Engineers Administrative Appeal Process by completing Section II of this form and sending the form to the division engineer. This form must be received by the division engineer within 60 days of the date of this notice.

C: PERMIT DENIAL: You may appeal the denial of a permit under the Corps of Engineers Administrative Appeal Process by completing Section II of this form and sending the form to the division engineer. This form must be received by the division engineer within 60 days of the date of this notice.

D: APPROVED JURISDICTIONAL DETERMINATION: You may accept or appeal the approved JD or provide new information.

- ACCEPT: You do not need to notify the Corps to accept an approved JD. Failure to notify the Corps within 60 days of the date of this notice, means that you accept the approved JD in its entirety, and waive all rights to appeal the approved JD.

- APPEAL: If you disagree with the approved JD, you may appeal the approved JD under the Corps of Engineers Administrative Appeal Process by completing Section II of this form and sending the form to the division engineer. This form must be received by the division engineer within 60 days of the date of this notice.

E: PRELIMINARY JURISDICTIONAL DETERMINATION: You do not need to respond to the Corps regarding the preliminary JD. The Preliminary JD is not appealable. If you wish, you may request an approved JD (which may be appealed), by contacting the Corps district for further instruction. Also you may provide new information for further consideration by the Corps to reevaluate the JD.

SECTION II - REQUEST FOR APPEAL or OBJECTIONS TO AN INITIAL PROFFERED PERMIT

REASONS FOR APPEAL OR OBJECTIONS: (Describe your reasons for appealing the decision or your objections to an initial proffered permit in clear concise statements. You may attach additional information to this form to clarify where your reasons or objections are addressed in the administrative record.)

ADDITIONAL INFORMATION: The appeal is limited to a review of the administrative record, the Corps memorandum for the record of the appeal conference or meeting, and any supplemental information that the review officer has determined is needed to clarify the administrative record. Neither the appellant nor the Corps may add new information or analyses to the record. However, you may provide additional information to clarify the location of information that is already in the administrative record.

POINT OF CONTACT FOR QUESTIONS OR INFORMATION:

If you have questions regarding this decision and/or the appeal process you may contact:	If you only have questions regarding the appeal process you may also contact:
Alaska District Corps of Engineers Fairbanks Regulatory Field Office (CEPOA-RD-N-C) 1046 Marks Road Fort Wainwright, AK 99703	Ms. Kate Bliss Regulatory Program Manager U.S. Army Corps of Engineers, Pacific Ocean Division CEPOD-PDC, Bldg. 525 Fort Shafter, HI 96858-5440 (808) 835-4626 Kate.M.Bliss@usace.army.mil

RIGHT OF ENTRY: Your signature below grants the right of entry to Corps of Engineers personnel, and any government consultants, to conduct investigations of the project site during the course of the appeal process. You will be provided a 15 day notice of any site investigation, and will have the opportunity to participate in all site investigations.

___________________________ Signature of appellant or agent.	Date:	Telephone number:

We appreciate your efforts in conserving listed species as part of your responsibility under the ESA. If you have questions regarding this consultation, please contact me at douglass_cooper@fws.gov or 907-891-6164 and refer to consultation number 2026-0057356.

Sincerely,

Acting Field Supervisor
Southern Alaska Fish and Wildlife Field Office

Enclosure: Biological Opinion

BIOLOGICAL OPINION
for the

Alaska Department of Transportation & Public Facilities Proposed King Cove to Cold Bay Road Project

Consultation Number 2026-0057356

Federal Action Agency

United States Army Corps of Engineers
Anchorage, Alaska

June 18, 2026

Consultation Prepared by:

U.S. Fish and Wildlife Service
Southern Alaska Fish and Wildlife Field Office
Anchorage, Alaska

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LIST OF ABBREVIATIONS USED IN THIS DOCUMENT

ADEC:	Alaska Department of Environmental Conservation
ADF&G:	Alaska Department of Fish and Game
ADOT&PF:	Alaska Department of Transportation and Public Facilities
ANILCA:	Alaska National Interest Lands Conservation Act
ANCSA:	Alaska Native Claims Settlement Act
ATV:	All-Terrain Vehicle
BiOp:	Biological Opinion
CI:	Confidence Interval
CFR:	Code of Federal Regulations
CUD:	Client Use Day
CWA:	Clean Water Act
dBA:	A-weighted decibels
DPS:	Distinct Population Segment
EIS:	Environmental Impact Statement
ESA:	Endangered Species Act
FR:	Federal Register
GAM:	Generalized Additive Model
IHA:	Incidental Harassment Authorization
ITR:	Incidental Take Regulation
ITS:	Incidental Take Statement
KCC:	King Cove Corporation
LOA:	Letter of Authorization
MMPA:	Marine Mammal Protection Act
MTRP:	Marking, Tagging, and Reporting Program (Service's Marine Mammals Management)
MU:	Management Unit
NMFS:	National Marine Fisheries Service (in-text citations only)
NOAA:	National Oceanic and Atmospheric Administration
OHV:	Off-highway Vehicle
PBF:	Physical and Biological Feature (equivalent to PCE)
PCE:	Primary Constituent Element (equivalent to PBF)
PSO:	Protected Species Observer
Refuge:	National Wildlife Refuge
RPM:	Reasonable and Prudent Measure
SAFWFO:	Southern Alaska Fish and Wildlife Field Office
SE:	Standard Error
SEIS:	Supplemental Environmental Impact Statement
Service:	U.S. Fish and Wildlife Service
SSA:	Species Status Assessment
SWPPP:	Stormwater Pollution Prevention Plan
T&C:	Term and Condition
USACE:	U.S. Army Corps of Engineers
USC:	U.S. Code
USFWS:	U.S. Fish and Wildlife Service (citations only)

1 INTRODUCTION

This document transmits the U.S. Fish and Wildlife Service's (Service) biological opinion, based on our review of the U.S. Army Corps of Engineers' (USACE) proposal to issue a permit pursuant to section 404 of the Clean Water Act (CWA) for the King Cove to Cold Bay Road project on the federally threatened Alaska-breeding population of Steller's eider (*Polysticta stelleri*), the threatened southwest Alaska Distinct Population Segment (DPS) of northern sea otter (*Enhydra lutris kenyonii*), and designated critical habitat for the Alaska-breeding population of Steller's eider and the southwest Alaska DPS of northern sea otter, in accordance with section 7 of the Endangered Species Act of 1973, as amended (16 U.S.C. 1531 *et seq*., ESA). The CWA 404 permit would allow for the construction of a single-lane gravel road to link King Cove, Alaska with the airport at Cold Bay, Alaska.

The federally endangered short-tailed albatross (*Phoebastria albatrus*) was considered due to its presence in Alaskan waters along the Aleutian chain. The species is associated with the continental shelf break and slope regions of the Bering Sea (Aleutian Archipelago) and, to a lesser extent, the Gulf of Alaska (Suryan and Kuletz 2018). Short-tailed albatrosses do not breed in the U.S., but forage extensively and spend considerable time in Alaskan waters along the Aleutian Archipelago. The species has not been recorded on Izembek National Wildlife Refuge and is unlikely to occur within the proposed action area (which comprises nearshore coastal waters not within the continental shelf break). The USACE has determined the proposed action will have no effect on the short-tailed albatross. Because we do not expect the species to be present in the action area, we concur with this determination; therefore, short-tailed albatross is not analyzed further in this biological opinion.

We have based this biological opinion on the best available scientific and commercial information from a variety of sources including the March 2026 Biological Assessment, May 2026 Addendum, the November 2024 draft Supplemental Environmental Impact Statement, the 2013 Final Environmental Impact Statement and Record of Decision, the Compensatory Mitigation Plan, Microsoft Teams and telephone conversations, emails, peer-reviewed publications, unpublished reports available through the Service, and other sources of information cited in the biological opinion. A complete record of this consultation is on file at the Southern Alaska Fish and Wildlife Field Office (SAFWFO) in Anchorage, Alaska.

1.1 Consultation History

- March 9, 2026: The SAFWFO received a biological assessment and request to initiate formal consultation on the proposed King Cove to Cold Bay road project.
- March 16, 2026: The SAFWFO met with representatives from the Alaska Department of Transportation and Public Facilities (ADOT&PF; the applicant) and USACE to discuss the biological assessment, request additional project information, and proposed conservation measures to avoid, reduce, and mitigate potential impacts to federally listed species.
- March 23, 2026: The ADOT&PF sent the SAFWFO an updated biological assessment per discussion and request on March 16.
- March 25, 2026: The ADOT&PF emailed the SAFWO confirmation of additional conservation measures that will be implemented.

- March 27, 2026: The SAFWFO met with ADOT&PF and USACE to discuss project details during the winter months and potential additional conservation measures. The ADOT&PF followed up by email confirming additional conservation measures that will be implemented.
- May 11, 2026: ADOT&PF submitted an addendum to their biological assessment, discussing off-road vehicular trails and boat vessel use as it pertains to the proposed action.
- May 20, 2026: ADOT&PF submitted additional information committing to placing signage pertaining to off-road vehicle laws and anadromous stream crossings.
- June 15, 2026: ADOT&PF submitted additional voluntary conservation measures related to public notice and education that they have committed to implement to further reduce the likelihood or magnitude of adverse effects.

1.2 Description of the Proposed Action

Regulations implementing the ESA (50 CFR 402.02) define "action" as, "all activities or programs of any kind authorized, funded, or carried out, in whole or in part, by Federal agencies in the United States or upon the high seas… ." The following is a description of the proposed action; additional information can be found in the March 2026 Biological Assessment (ADOT&PF 2026*a*, *b*).

The proposed action considered herein is the issuance of a permit pursuant to section 404 of the CWA by USACE for the King Cove to Cold Bay Road project. The proposed road would be 18.9 miles (mi) (30.4 kilometers [km]) of a single-lane, gravel road from the existing King Cove Access Road northeast terminal, at the eastern end of the isthmus, to the intersection of Outer Marker Road and Blinn Lake Loop, near the Cold Bay Airport (Figure 1). There are no proposed restrictions on use of the road, and guardrails to address potential off-road vehicular traffic transgressions into Izembek Refuge are not included as part of the proposed design standard.

The general route for the road corridor is identified in U.S. Survey 14495 and is also the same route identified as "Alternative 2 southern road alignment" in the 2013 final Environmental Impacts Statement (EIS), with minor adjustments based on further refinement and design by the ADOT&PF (ADOT&PF 2026*a*). Road construction would include 14 material sites along the road corridor, with two additional material sites planned for development if needed (one existing material site that would be expanded near the Northeast Terminal located on King Cove Corporation [KCC] lands and one new material site with an access road located near Milepost 4.9 of the proposed road). Road construction is anticipated to span three construction seasons over 3 years, which may include year-round activities, commencing in Fall 2026. Construction would primarily occur between May and November. At the closest point, the road would be located 0.5 to 1 mi (0.8 to 1.6 km) from Kinzarof Lagoon, 0.7 mi (1.1 km) from Izembek Lagoon, and 1.7 mi (2.7 km) from Moffet Lagoon. The closest material site to Kinzarof Lagoon is 0.33 mi (0.53 km), and the closest material site to Izembek Lagoon is 0.7 mi (1.13 km). The road is assumed to have an operational lifespan of 50 or more years, with maintenance required over the life of the road. Thus, the proposed action would span 53 years.

The areas that would be affected through construction and use of a road between the City of King Cove and the Cold Bay Airport are described in the Action Area, section 1.3.

Figure 1. Map of the proposed action area. The proposed action area (dark red line) includes the entire road corridor (bright red line) and the surrounding areas that might be impacted from road construction and use.

Figure 2. Map of the proposed action. The proposed road (red) would connect the communities of King Cove and Cold Bay using a single-lane road starting at the King Cove Access Road and ending at the Outer Marker Road. The proposed action is primarily on land owned by the King Cove Corporation (purple; follows the footprint of the proposed road) and the Federal Aviation Administration (gray; not included in the map legend).

1.3 Action Area

The action area is defined (50 CFR 402.02) as, "all areas to be affected directly or indirectly by the Federal action and not merely the immediate area involved in the action." We consider the entire road corridor and the surrounding areas that might be impacted by road construction and use to be included in the action area. Therefore, the Service has determined the action area encompasses the entirety of the isthmus between Izembek and Kinzarof Lagoons (hereafter, Izembek Isthmus); Kinzarof, Moffet, and Izembek Lagoons, where we predict an increase in human activity due to increased access facilitated by a road; and the marine waterbody of Cold Bay, from Kinzarof Lagoon south to the mouth of Cold Bay at Deer Island, where barging and vessel traffic associated with the proposed action are expected to increase above current baseline levels (Figure 22). The action area contains habitat used by Steller's eiders during fall migration and molt, spring migration and staging, and wintering for foraging, resting, and courtship and pair bonding and nearshore habitats used by northern sea otters year-round as natal grounds, protection from predators, shelter from storms, and for access to prey. The action area also contains portions of the critical habitat designated for each species (see section 3, Status of the Species and Critical Habitat).

1.3.1 Izembek Isthmus

The Izembek Isthmus is a narrow (approximately 3 mi [4.8 km] wide) isthmus comprised of a low-lying wetland complex consisting of wet sedge meadows and numerous lakes and ponds interspersed with upland tundra. The isthmus is situated between the highly productive waters of the Bering Sea and the Gulf of Alaska and is hydrologically connected to Izembek, Moffet, and Kinzarof Lagoons. It is crossed by multiple anadromous streams. There is an existing network of roads and trails near the communities of Cold Bay and King Cove, on either end of the isthmus. Some overgrown trails also exist in portions of the isthmus, left over from the military's presence in the area during and after World War II (USFWS 2003).

Groundwater in this area is generally unconfined within sand and gravel lenses and is recharged through the infiltration of rainfall and snowmelt. Groundwater is assumed to flow from south to north along the slopes of Frosty Peak, discharging into Cold Bay via Kinzarof Lagoon and/or into Izembek Lagoon (Rice and Hogan 1995). The proposed action on the Izembek Isthmus would include the following:

- Construction of a single-lane, unpaved gravel road. The road would be approximately 18.9 mi (30.4 km) long, with a 13-foot (3.96-meter [m]) travel width and approximately 113 intervisible turnouts to allow for two-way traffic. One bridge would be constructed to span an unnamed major stream, and approximately 93 culverts or pipe arches would be installed at additional stream crossings. The project would also include development of 14 material sites to supply construction materials.
    - The new road alignment would begin at the terminus of the existing King Cove Access Road near the Northeast Terminal, extending in a northerly direction for approximately 2.6 mi (4.2 km) before crossing an unnamed tributary of Kinzarof Lagoon, requiring a bridge. The total length of the bridge would be approximately 125 feet (ft) (38.1 m) long by 19 ft (5.79 m) wide (ADOT&PF 2026*a*).

- The road corridor would continue northerly for approximately 3.7 mi (5.9 km) before turning west; continue westerly for approximately 7 mi (11.3 km) before turning southwest; and continue southwesterly for approximately 5.6 mi (9 km) where it would terminate at the intersection of Outer Marker Road and Blinn Lake Loop.
- Drainage structures would include 62 ‘dry culverts,’ such as equalization pipes, which allow incidental drainage to pass under the roadway; 23 ‘wet culverts’ that are in defined stream channels or connecting wetlands; and 8 fish passage culverts.
- The proposed road is primarily on lands owned by the KCC and the Federal Aviation Administration near Blinn Lake Loop Road. The corridor lies outside marine and tidally influenced waters and generally follows upland ridges, existing roads, jeep trails, and disturbed areas where practicable.

* The proposed action encumbers other lands that were not part of the 2025 Land Exchange, as described below:
    - Approximately 12 acres (ac) (5 hectares [ha]) of other Federal property currently administered by the Federal Aviation Administration as an air navigation site (Withdrawal No. 176); this includes approximately 0.4 mi (0.64 km) of the road corridor from mi 18.5 to the intersection with Outer Marker Road.
    - A section of the proposed road corridor near the intersection of Outer Marker Road and Blinn Lake Loop, approximately 2 ac (0.8 ha) and less than 0.1 mi (0.16 km) in length, is within a 22.95-ac (9.29-ha) parcel of private land. Authorization for use of the road would have to be obtained from the current owner of this parcel.
    - An approximately 3-mi section of the proposed road near the King Cove hovercraft terminal is located on lands that the U.S. conveyed to KCC prior to the 2025 land exchange conveyances. The U.S. owns the subsurface estate. The Fish and Wildlife Service is in the process of a compatibility determination pursuant to 50 CFR 25.21.
* Fourteen material sites have been identified for construction of the proposed road:
    - Most extraction of material for the roadway would be accomplished via expansion of the cut limits in areas of competent material.
    - The material sites along the proposed road corridor vary in size, with the largest (both by disturbed surface area and volume of material extracted) being Site 780+00, which would be 561 ft (171 m) long by 651 ft (198 m) wide, containing 247,414 cubic yd (189,162 cubic meters [m^3]) of excavated material (ADOT&PF 2026*a*).
    - Two additional material sites are planned for development if needed: one existing material site that would be expanded near the Northeast Terminal located on KCC lands and one new material site with an access road located near Milepost 4.9 of the proposed road.
* Three water sources have been preliminarily identified for use during road construction:
    - Shake Lake, a 33-ac (13.4-ha) lake that is unconnected to anadromous waters, located on the west end of the current Izembek Wilderness boundary;
    - Bactrian Lake, a 128-ac (51.8-ha) lake located midway along the road alignment, connected to Kinzarof North Stream (Anadromous Waters Catalog #283-34-10500; ADF&G 2024);
    - Southeast Kinzarof Stream (Anadromous Waters Catalog #283-34-10700; ADF&G 2024), located on the east end of the proposed road;

  - Blinn Lake, a 150-ac (60.7 ha) lake near the western terminus of the proposed road, was originally considered as a potential water source; however, due to suspected per- and polyfluoroalkyl substances (PFAS) contamination, Blinn Lake will not be used as a source of water for the project.
- No permanent structures would be built to facilitate construction logistics. However, mobile offices (such as Conex offices) for field staff and other storage sheds may be brought in as necessary during construction. Possible staging sites for temporary support facilities include the Northeast Terminal, Lenard Harbor, the City of King Cove, and the City of Cold Bay.

1.3.2 Greater Cold Bay

Cold Bay is a large, deepwater embayment of the Pacific Ocean located on the south (i.e., Gulf of Alaska) side of the Alaska Peninsula. Within approximately 1,600 ft (500 m) of the shoreline, water depth in Cold Bay increases gradually to 20 ft (6 m), beyond which water depths increase rapidly and approach 197 ft (60 m) in depth at 3,280 ft (1 km) from shore. The City of Cold Bay, approximately 50 residents (USCB 2020*a*), is located on the northwestern shore of this large waterbody, near the head of the bay. The City of King Cove, approximately 757 residents (USCB 2020*b*), is located 18 mi (29 km) southwest of the City of Cold Bay, just outside the bay itself.

In this region, winters are cold and stormy, and summers are mild and cloudy due to moderating effects of the ocean. Autumn arrives in early October and is usually the wettest season. The first frost usually occurs in October or November. In winter, snow often alternates with rain. Sea ice can form in the coastal lagoons and bays during the winter.

Cold Bay is lined with multiple shallow lagoons, including Kinzarof Lagoon, which is located at the northern head of Cold Bay. The Cold Bay embayment is about 8.7 mi (14 km) across at its widest point and protrudes inland approximately 24.9 mi (40 km) (Rice and Hogan 1995). Cold Bay, like many coastal areas on the Alaska Peninsula, is characterized by a two-layered, estuarine-circulation system. In this system, spring season brings increased freshwater that drives freshwater flows seaward along the surface. This freshwater is replaced by saltwater that intrudes at greater depths. In fall and winter, storms and reduced runoff combine to mix the layers and destroy this system (Rice and Hogan 1995).

The coastline of Cold Bay is made up of gravel, sand and gravel beaches, and sand and mud beaches of various widths and inclines, as well as riparian and lagoon habitat (NOAA 2025). Although Cold Bay is largely unvegetated, the nearshore habitat of Cold Bay is lined with patchy and continuous bands of soft brown kelp (*Laminaria*) species and dragon kelp (*Eularia fistulosa*) (NOAA 2025). Continuous and patchy eelgrass (*Zostera marina*) habitat also occurs around much of Cold Bay (NOAA 2025). More than ten anadromous streams feed into Cold Bay (ADF&G 2024).

The proposed action would involve the following activities in and adjacent to the waters of Cold Bay:

- Two temporary barge landing sites would be developed to permit the delivery of materials and equipment to both ends of the proposed road. These two barge landing sites, each 0.5-ac (0.2-ha) in size, would be placed adjacent to existing hovercraft ramps or previously disturbed or developed areas. Barges will not travel north of a straight line between the Northeast Hovercraft Terminal and the Cross Wind Cove Hovercraft Terminal.
- Earthwork equipment (such as graders, loaders, and potentially a crane for bridge girder placement) will be barged in as needed.
    - Regularly scheduled barge sailings to this region include a once-weekly barge service from Seattle to King Cove (or Cold Bay). Barges can land in King Cove year-round.
    - Barge sailing stops to nearby communities vary depending on several factors, such as weather and demand. Typical routing of a regularly scheduled barge could be: Seattle-Chignik-Sand Point-King Cove-Cold Bay.
    - The contractor may charter additional barges beyond the regularly scheduled service if needed to support operations. However, no project-specific barges will be added from December 1 through March 30. To the extent practicable, dedicated barges will be added during the summer months (May 1 to August 15). Chartered barge service would be more direct from origin to destination.
- No permanent structures would be built to facilitate construction logistics. However, mobile offices (such as Conex offices) for field staff and other storage sheds may be brought in as necessary during construction. Possible staging sites for temporary support facilities include the Northeast Terminal, Lenard Harbor, the City of King Cove, and the City of Cold Bay.

1.3.3 Izembek, Moffet, and Kinzarof Lagoons

Izembek and Moffet Lagoons (hereafter, Izembek Lagoon, except where otherwise noted) are connected bodies of water on the Bristol Bay side of the Izembek Isthmus, whereas Kinzarof Lagoon is on the opposite side of the isthmus and is connected to Cold Bay and the greater Gulf of Alaska. Izembek Lagoon experiences a vastly different tidal cycle relative to Kinzarof Lagoon: Izembek Lagoon experiences semi-diurnal and mixed diurnal tides, with a typical semi-diurnal tidal range of 5.3 ft (1.6 m; Environmental Science and Engineering Inc. 1989). Kinzarof Lagoon, like Cold Bay, experiences a semi-diurnal tide ranging from 23 to 26 ft (7 to 8 m). The tides between these two sides of the Izembek Isthmus are not synchronous.

Ice often covers more than 75 percent of Izembek Lagoon for 1 to 2 months annually, between December and March, but ice conditions vary annually (Ward et al. 1997, Petrich et al. 2014). During harsh winters, such as the winter of 2025/2026, Izembek Lagoon will freeze to the bottom, whereas Kinzarof Lagoon (and Cold Bay) typically remains open. Due to the asynchronous tides, differences in icing conditions, and effects of wind direction, wildlife (especially waterfowl but also otters in extreme icing years such as 2025/2026) will respond to seasonally changing conditions by moving across the isthmus between Izembek Lagoon and Kinzarof Lagoon and Cold Bay. Together, Izembek and Kinzarof Lagoons form the “Izembek

Complex," which henceforth we use to include Cold Bay, the lagoons, isthmus, and connected watersheds.

Izembek Lagoon is a marine body of water formed by long, narrow, sparsely vegetated barrier islands (the Kudiakof Islands) along the Izembek Isthmus, on the north side of the Alaska Peninsula near its southwestern tip. Izembek Lagoon is connected to Bristol Bay and in turn the Bering Sea. The southwestern end of the lagoon is located about 6.2 mi (10 km) north of the city of Cold Bay, Alaska. Izembek Lagoon contains extensive eelgrass beds that are exposed at low tide, along with sandflats and mudflats (78 percent of the lagoon; McRoy 1966) and a few deeper channels connecting the lagoon to the Bering Sea (22 percent of the lagoon; McRoy 1966). Much of the lagoon is less than 6.5 ft (2 m) deep (Petrich et al. 2014). Izembek Lagoon contains the largest eelgrass beds in the world (Ward et al. 1997); about 44 to 47 percent of the lagoon is vegetated with eelgrass (Ward et al. 2022). Macro-invertebrate surveys found that gastropods and *Caprella* shrimp were the most common macro-invertebrates in Izembek Lagoon, but crabs, sponges, sea stars, and mussels were also found (Ward et al. 2022). Izembek Lagoon contains only small bands of patchy and continuous soft brown kelp (*Laminaria*) species, primarily in Norma Bay and Applegate Cove (NOAA 2025). Izembek Lagoon is connected to Moffet Lagoon.

Moffet Lagoon is functionally part of Izembek Lagoon, with its southwestern boundary located about 15 mi (24 km) northeast of the City of Cold Bay. Much of Moffet Lagoon is vegetated with eelgrass, with sandflats and mudflats close to gaps between barrier islands. Moffet Lagoon is fed by major freshwater inlets such as the Joshua Green River (Ward et al. 2022).

Kinzarof Lagoon, located 5 mi (8 km) northeast of the City of Cold Bay, is hydrologically connected to Cold Bay and the Gulf of Alaska. Like Izembek Lagoon, eelgrass covers about 45 to 50 percent of Kinzarof Lagoon. This is the largest eelgrass bed on the Pacific side of the Alaska Peninsula (USFWS/Williams 2023). Seaweeds cover about one-third of Kinzarof and are much more prevalent than in Izembek. Their prevalence in Kinzarof is likely linked to the rockier substrate in Kinzarof Lagoon, which is ideal attachment surface for seaweeds. Small bands of patchy and continuous soft brown kelp (*Laminaria*) species are also present (NOAA 2025). Mud is a dominant sediment in Kinzarof Lagoon (Feder and Jewett 1987). Surveys found that macro-invertebrates were generally less common in Kinzarof Lagoon than Izembek Lagoon. *Telmessus* crab was the most common macro-invertebrate surveyed in Kinzarof Lagoon and was more common than in Izembek. Gastropods and *Caprella* shrimp were also found but mussels were absent. Peak eelgrass biomass in these lagoons usually occurs July to August (Ward et al. 2022).

1.4 Proposed Road from City of King Cove to Cold Bay Airport

The proposed section 404 CWA permit issuance under consideration would allow for the construction of an 18.9-mi (30.4 km) single-lane, gravel road on the Izembek Isthmus, between the City of King Cove and the Cold Bay Airport. The road would be 13 ft (3.96 m) wide at the surface with an approximately 24-ft-wide (7.3 m) subgrade (USFWS 2024, 2025*a*, ADOT&PF 2026*b*). A centerline survey, geotechnical investigations, and other detailed site surveys have not been completed for the proposed road. While the section 404 CWA permit covers only road construction, the complete action as proposed by the applicant in the Biological Assessment includes road use and maintenance. Specific information noted herein is derived from the final Biological Assessment (ADOT&PF 2026*a*, *b*).

1.4.1 Road Design Criteria

The proposed road would be 13 ft wide (4 m) at the surface (11-ft [3.4-m] driving lane with two, 1-ft [0.3-m] shoulders), with approximately 113 turnouts constructed along the road corridor to enable safe passage of approaching vehicles. The total footprint of new road construction, including material sites, would be 186 ac (75 ha). The final Biological Assessment prepared by DOWL for the ADOT&PF notes design guidance for the proposed road is based on the American Association of State Highway and Transportation Officials Policy on Geometric Design of Highways and Streets ("Green Book," updated in 2018) and Guidelines for Geometric Design of Very Low Volume Roads (AASHTO 2018, 2019), and the ADOT&PF 2005 Alaska Highway Pre-Construction Manual (ADOT&PF 2025). The Biological Assessment states the road alignment has been developed to a 95 percent design level based on ADOT&PF's plan set dated February 22, 2026 (ADOT&PF 2026*a*).

Based on reconnaissance-level design, the proposed road would require 94 drainage structures. These would include one bridge over an unnamed major tributary of Kinzarof Lagoon near mi 2.6 (Anadromous Waters Catalog #283-34-10700; ADF&G 2024); 62 'dry culverts,' such as equalization pipes, which allow incidental drainage to pass under the roadway; 23 'wet culverts' that are in defined stream channels or connecting wetlands; and 8 fish passage culverts. The bridge would be a single lane, and, per the project design criteria, the average daily traffic would be less than 50 vehicles. Culverts would be designed for the 50-year storm event in final design and analyzed for passage of the 100-year storm event where drainage structures are located in a flood zone. Fish passage design for crossings over fish-bearing streams would follow the Memorandum of Agreement between Alaska Department of Fish and Game (ADF&G) and Alaska Department of Transportation and Public Facilities (ADOT&PF) for the Design, Permitting, and Construction of Culverts for Fish Passage (ADF&G and ADOT&PF 2025) and the Service's Culvert Design Guidelines for Ecological Function (Revision 10, 2025, *https://www.fws.gov/alaska-culvert-design-guidelines*).

1.4.2 Road Construction Activities and Materials

Construction of the road would likely occur over 3 years with activities potentially occurring year-round, but most likely between May and November. Major activities involved with construction would include development of material sites and processing of crushed rock; piledriving for bridge construction; road embankment construction; water withdrawal from local sources for road embankment compaction and dust control; heavy equipment operation; placement of temporary mobile offices, storage sheds, and lighting equipment; and vessel operations. Specific details noted herein are derived from the final Biological Assessment (ADOT&PF 2026*a*, *b*).

Material for construction of the road would be excavated from the proposed road corridor via expansion of the cut limits in areas of competent material. The material site activities will include clearing and grubbing, excavation, fill placement, grading, compaction, and seeding. No blasting will be permitted on site. Approximately 1.7 million cubic yd (cy) (1.3 million m^3) of material would be moved during cut and fill activities, and 1.02 million cy (779,846 m^3) of crushed rock would be used for road construction. An additional 10,150 cy (7,760 m^3) of crushed rock would be processed for riprap. Organic soils and other materials disturbed during construction that are considered unusable for construction would be staged and stockpiled within the road corridor, then used for finishing graded backslopes and reclaiming abandoned sections of existing roads and trails.

Ground disturbance associated with the bridge would be limited to grading and fill for the abutments, abutment placement, driving h-piles, and stream straightening and armoring (riprap Class II). Bridge construction is anticipated to require concussive hammering (depending on geotechnical constraints) to install eight steel closed end pipe piles (ADOT&PF 2026*a*). The steel pile lengths may vary, but are not anticipated to exceed 150 ft (45.7 m) in length and 24 inches (61 centimeters) in diameter. No pile driving will occur from January 1 through March 30, and to the extent practicable, pile driving will only occur May 1 to October 30.

Construction equipment will likely include, at a minimum; two graders, one excavator, two dozers, one backhoe/front-end loader, two pickup trucks, one flatbed truck, two worker vehicles, and at least one dump truck. Water for embankment compaction and dust control would be supplied from three water sources, two lakes and one stream, during road construction. Water requirements over the course of construction are expected to be relatively low due to typically wet weather in the action area.

During construction and at barge landing sites, mobile lights may be temporarily used to facilitate safe operation of the worksite. Mobile lighting equipment typically extends up to 30 ft (9 m) into the air, but temporary lighting will be limited to no more than 20 ft (6 m) in height, except when necessary for health and human safety. Construction occurring from November 1 through April 30 will only occur during daylight hours. Equipment lighting, such as on graders, would be used as necessary during construction; however, it is expected that most construction activities will occur during daylight hours.

1.4.3 Road Use and Maintenance

The proposed road is assumed to have a lifespan of greater than 50 years, with gravel for maintenance required over the life of the road (ADOT&PF 2026*b*). Roads and trails constructed during World War II have persisted on the landscape of the Izembek Isthmus long past their period of maintenance (see section 4.1 and DOI/USFWS2013*a*). Thus, we expect the road will continue to exist on the landscape and be used by four-wheel drive and off-road vehicle long after maintenance of the road ceases, and we define the lifespan of the road as 100 years for purposes of this biological opinion.

Use of the road would involve regular vehicle traffic transiting between the communities of King Cove and Cold Bay. The single lane bridge would be built, per the project design criteria, for the Average Daily Traffic of less than 50 vehicles per day. There would not be permanent lighting along the roadway post-construction, and the potential for hazardous waste generation during operation would be minimal and comparable to that associated with other low traffic volume rural roads in Alaska. Noise associated with ongoing road maintenance and use by vehicles transiting between the communities of King Cove and Cold Bay would have similar sources and effects as construction-related noise, and would depend on weather conditions, types and speeds of vehicles, and other factors.

The Aleutians East Borough (AEB) would be responsible for road maintenance and operation under their normal operation plans (ADOT&PF 2018). Maintenance activities are anticipated to include snow plowing, grading of the surface as required, and any repairs needed over the life of the road (e.g., erosion or settlement repairs). This work would be completed as needed and require minor ongoing use of fuels and lubricants associated with routine vehicle traffic and maintenance activities. The AEB may need to operate a grader, snowplow, and/or excavator; however, no new personnel are anticipated. ADOT&PF isis not planning for new personnel or equipment to be stationed at the Cold Bay Maintenance Station (ADOT&PF 2026*b*). The road is expected to be low-volume, which means the road would likely be graded every 5 years to re-level the surface (i.e., fix ruts and degradation). It is expected that the road would need to be resurfaced approximately every 10 to 15 years depending on usage, and resurfacing would occur simultaneously with grading activities. Mowing (although unlikely) may also occur if needed. When maintenance occurs, materials are anticipated to be staged on the road surface.

1.5 Conservation Measures

The ADOT&PF has committed to conservation measures as part of the proposed project to minimize adverse effects to northern sea otters and Steller's eiders resulting from the proposed action.

The following measures will be implemented as part of the proposed action.

1. Sea Otter Best Management Practices for Vessel Operations:
   - For smaller vessels (less than 80 ft [24 m]), vessels will maintain a minimum distance of 328 ft (100 m) from single sea otters, 656 ft (200 m) from female-pup sea otter pairs and 1,640 ft (500 m) from rafts of sea otters (groups of 10 sea otters or more) when safe and practicable.
   - For larger vessels (greater than 80 ft [24 m]), vessels will maintain a minimum distance of 984 ft (300 m) from sea otters when safe and practicable.
   - If vessel operators observe sea otters consistently flushing in response to the vessel transiting at the minimum distance, then the vessel operator shall increase the minimum distance until sea otters are no longer flushing in response to the vessel.
   - Vessels shall maintain maximum distance practicable from areas of surface kelp.
   - If marine mammals approach a vessel, place engines in neutral and allow them to pass.
   - All operations shall take precautions to minimize the risk of spilling fuels.
   - While operating skiffs in near shore areas, scan the water surface ahead of the boat vigilantly for otters. In choppy water conditions sea otters are difficult to spot.
   - If you are boating with another person, place them in the bow to help search. You may encounter otters as individuals, a mother and a pup, or rafts of 10 or more.

- When you see an otter(s), alter your course and slow down to avoid disturbance and collision. Once you have spotted an otter(s), you should not assume that the otter(s) will dive and get out of the way. Even if they are alert, capable, and do dive, your action of knowingly staying your course would be considered harassment.
- Do not operate a skiff at ANY rate of speed heading directly at the otter(s). A good rule of thumb is that your buffer should be great enough that there is ample room for the otter(s) to swim away without startling them. It is your responsibility to minimize the stimulus and threat of a loud boat approaching quickly.

2. Steller's Eider Best Management Practices for Vessel Operations:
   - If Steller's eiders are identified, vessel operators will follow procedures identical to those for sea otters to avoid disturbance or collision.
3. Essential Fish Habitat measures for stream crossings (that will also help reduce impacts to designated critical habitat downstream by decreasing bank erosion, supporting natural vegetation, and increasing long term stability of banks):
   - Natural vegetation will be retained along streams to the greatest extent practicable. This will be accomplished by requiring contractors to salvage the vegetated mat along stream banks prior to ground disturbance.
   - This vegetated mat will be maintained (usually via periodic watering) until the revegetation stage and staked in place for reestablishment.
   - In addition, further mitigation of impacts such as willow staking and the placement of large woody debris will be analyzed for employment at these locations.
   - The deployment of riprap in streams will be limited and only installed where it is required for protection of infrastructure.
4. Lighting can disorient birds in flight and may disturb Steller's eiders on water within critical habitat. Construction occurring from November 1 through April 30 (when numerous eiders are present) will only occur during daylight hours. Temporary lighting will only be used when needed for health and human safety. The trespass of light into nearby habitats will be minimized using down shielding or directional lighting, and low intensity lighting.
5. The project design does not include permanent vertical structures, and permanent lighting will not be permitted along the road corridor. Temporary construction lighting heights will be limited to no greater than 20 ft (6 m), except for when needed for health and human safety.
6. Barges will not travel north of a straight line between the Northeast Hovercraft Terminal and the Cross Wind Cove Hovercraft Terminal.
7. No project-specific barges (i.e., beyond regularly scheduled weekly barges servicing the City of Cold Bay) will be added from December 1 through March 30. This avoids the window/wintering period when eiders are expected to be present in the embayment of Cold Bay. To the extent practicable, project specific barges will be added during the summer months (May 1 to August 15).
8. No pile driving will occur from January 1 through March 30. To the extent practicable, pile driving will occur when fewer eiders are present (May 1 to October 30).
9. Erosion control measures that have minimal additional habitat impacts (e.g., weed-free gravel, weed-free erosion control materials, and erosion control materials without plastic; https://plants.alaska.gov/invasives/weed-free.htm) will be used, to the extent possible and

practical, to prevent sedimentation into waterways that may otherwise impact wetland and marine habitat.

10. Standard recommendations for preventing bird-vessel strike in the marine environment will be implemented for project vessels (*https://www.fws.gov/service/technical-assistance-prevent-bird-vessel-strike-alaska-marine-environment*). This includes ensuring that the trespass of light into nearby habitats is minimized using construction timing restrictions, down shielding or directional lighting, and low intensity lighting and that any project-related vessels keep deck lighting to a minimum, and shield lights to direct illumination inboard and downward to the extent possible while still maintaining compliance with navigation rules, reduce outward-radiating light, and avoid red steady-state lighting on vessels to decrease the potential for Steller's eider strikes. Vessel windows should be shaded to the extent practicable when indoor spaces must be lit at night.
11. Use of contaminated materials that can impact ESA-listed species and their habitats will be avoided. Prior to development of previously existing material sites, or use of water sources, soil and gravel sources and water will be periodically tested for potential historical contamination and to mitigate the potential for acid rock drainage. If heavy metal or other regulated contaminants are detected within soil sources, they will not be excavated or used on the road.
12. Marine vessels will reduce speeds to 8 knots or less when traversing Steller's eider critical habitat, when eiders are present, and to reduce flushing Steller's eiders while resting, staging, or molting. In nearshore areas, vessel operators should scan the water surface ahead of the vessel for Steller's eiders and, if detected, slow down, change direction away from Steller's eiders, and maintain a distance of 546 yards (yd) (500 m) or more when practical. If the vessel operator or observers notice agitated or "startle" behavior, back the vessel away or change course.
13. If barging materials is necessary to support the project ADOT&PF will develop a Marine Mammal Protection Plan that identifies specific measures to be implemented to avoid potential disruption to the normal behavior of northern sea otters within the proposed action area during construction, operation, and maintenance.
    - Avoid traveling through high density sea otter habitat.
    - Travel in a predictable manner and avoid sudden changes in speed and direction when in the vicinity of sea otters.
    - Practice speed reductions during times of limited visibility and in areas with sea otters.
    - Avoid separating individual members from a group of sea otters, encircling sea otters, and impeding movement of sea otters. Change course heading to avoid an interaction and impact to sea otters in the water.
    - Travel using established navigation channels or commonly recognized vessel traffic corridors and avoid alongshore travel in shallow water (less than 66 ft [20 m]) whenever practicable.
    - Provide written guidance to vessel operators for avoiding collisions and minimizing disturbances to sea otters.
    - Engage in methods to limit vessel noise, such as reducing speed, performing regular vessel maintenance, using fewer vessels, and/or implementing vessel-quieting

technologies (e.g., propeller design, wake improvement devices, propulsion enhancement measures, hull treatment solutions).
- To reduce effects to sea otters, Alaska Sea Otter-Safe Boating: Guidance for Vessel Operators (*https://www.fws.gov/sea-otters-boater-guidance*) should be followed.

14. Protective measures stipulated in a Fish and Wildlife Protection Plan and a Marine Mammal Protection Plan, Erosion and Sediment Control Plan, Stormwater Pollution Prevention Plan, Hazardous Material and Petroleum Product Control Plan, and Fuel Handling and Spill Response Plan will all be developed to alleviate impacts of human disturbance to listed species and reduce potential habitat impacts associated with construction, operation, and maintenance of the road.
15. The ADOT&PF commits to installation of signage thatat informs the public of the law prohibiting vehicular access to anadromous streams.
16. An independent Environmental Monitor will be onsite throughout construction to provide training and ensure compliance with environmental protection plans and permit conditions.
17. The ADOT&PF will provide technical assistance in the gathering and publishing of an oral history of subsistence use patterns in the community of King Cove. The technical assistance will be provided to the King Cove Group (KCG), consisting of the Agdaagux Tribe of King Cove, the Belkofski Tribal Council, King Cove Corporation, City of King Cove, and Aleutians East Borough by or under the direct supervision of a qualified individual(s) meeting the Secretary of the Interior’s Professional Qualification Standards for Archaeology and/or History.
18. The ADOT&PF will work with the KCG to design appropriate signs for the beginning and end of the project limits to inform drivers that motorized vehicles are only authorized on the road prism. DOT&PF will have the signs produced and installed as part of the road construction project, and DOT&PF will require repair or replacement of damaged signs as a road maintenance condition.
19. The ADOT&PF will work with the KCG and the Service to design appropriate screens or barriers to camouflage or physically discourage continued use of established roads and ORV trails in the Refuge. ADOT&PF will work with the King Cove Corporation to install appropriate screens or barriers within the road corridor as part of the road construction project.
20. The ADOT&PF will work with the King Cove Group and the Service to design informational materials, for distribution in King Cove and Cold Bay, regarding public travel on the road, speed limits, sensitive environmental conditions, and on the prohibition of motorized vehicles anywhere beyond the road prism.

Other conservation measures include commitment to ongoing collaboration and coordination between King Cove Corporation, ADOT&PF, and the Service; minimizing invasive species; proper waste management and disposal; vegetation clearing, ground disturbance, and other site construction activity (i.e., nesting habitat removal) timing restrictions; and dust control. Additional measures are listed in the biological assessment (ADOT&PF 2026*b*) and Compensatory Mitigation Plan (ADOT&PF 2026*c*) and are incorporated by reference.

2 ANALYTICAL FRAMEWORK FOR JEOPARDY AND DESTRUCTION / ADVERSE MODIFICATION DETERMINATIONS

2.1 Jeopardy

In accordance with our regulations (see 50 CFR 402.02, 402.14(g)), the jeopardy determination in this biological opinion relies on the following four components:

1. The Status of the Species component evaluates the species' current range-wide condition relative to its reproduction, numbers, and distribution; the factors responsible for that condition; its survival and recovery needs; and explains if the species' current range-wide population retains sufficient abundance, distribution, and diversity to persist and retains the potential for recovery (see USFWS and NMFS 1998).

2. The Environmental Baseline component refers to the condition of the listed species in the action area, without the consequences to the listed species caused by the proposed action (50 CFR 402.02). The environmental baseline includes the past and present impacts of all federal, State, or private actions and other human activities in the action area, the anticipated impacts of all proposed federal projects in the action area that have already undergone formal or early section 7 consultation, and the impact of State or private actions which are contemporaneous with the consultation in process. The impacts to listed species from federal agency activities or existing federal agency facilities that are not within the agency's discretion to modify are part of the environmental baseline.

3. The Effects of the Action component evaluates all direct and indirect effects of an action on the species or critical habitat, together with the effects of other activities that are interrelated or interdependent with that action, that will be added to the environmental baseline. The environmental baseline includes the past and present impacts of all Federal, State, or private actions and other human activities in the action area, the anticipated impacts of all proposed Federal projects in the action area that have already undergone formal or early section 7 consultation, and the impact of State or private actions which are contemporaneous with the consultation in process. Indirect effects are those that are caused by the proposed action and are later in time, but still are reasonably certain to occur. Interrelated actions are those that are part of a larger action and depend on the larger action for their justification. Interdependent actions are those that have no independent utility apart from the action under consideration.

4. The Cumulative Effects component evaluates those effects of future State or private activities, not involving federal activities, that are reasonably certain to occur within the action area of the federal action subject to consultation.

In determining whether an action is likely to jeopardize the continued existence of a species, the action is viewed against the aggregate effects of everything that has led to the species' current status and, for non-federal activities, those things likely to affect the species in the future (USFWS and NMFS 1998).

"Jeopardize the continued existence of" means to engage in an action that reasonably would be expected, directly or indirectly, to reduce appreciably the likelihood of both the survival and recovery of a listed species in the wild by reducing the reproduction, numbers, or distribution of that species (50 CFR 402.02).

In accordance with 50 CFR 402.14(g), the Service is responsible for (1) reviewing all relevant information provided by the Federal agency or otherwise available; (2) evaluating the current status and environmental baseline of the listed species; (3) evaluating the effects of the action and cumulative effects on the listed species; and (4) adding the effects of the action and cumulative effects to the environmental baseline and in light of the status of the species, and (5) formulating the Service's opinion as to whether the action is likely to jeopardize the continued existence of listed species.

2.2 Destruction / Adverse Modification

On March 30, 2026, in *Center for Biological Diversity v. Burgum*, No. 24-cv-04651 (N.D. Cal.), the U.S. District Court for the Northern District of California vacated aspects of four provisions from the 50 CFR part 402 regulations governing interagency consultation under section 7 of the Endangered Species Act and reinstated the provisions that were previously in effect. Consistent with the Court's ruling, we use the following definition: "Destruction or adverse modification means a direct or indirect alteration that appreciably diminishes the value of critical habitat for the conservation of a listed species. Such alterations may include, but are not limited to, those that alter the physical or biological features essential to the conservation of a species or that preclude or significantly delay development of such features."

In accordance with our regulations (see 50 CFR 402.02, 402.14(g)), the destruction or adverse modification determination in this biological opinion relies on the following four components:

1. The <u>Status of Critical Habitat</u> component evaluates the range-wide condition of the critical habitat in terms of essential habitat features, primary constituent elements (PCEs), also known as physical and biological features (PBFs), that provide for the conservation of the listed species; the factors responsible for that condition; and the intended value of the critical habitat for the conservation of the listed species. (see Endangered Species Consultation Handbook, March 1998).

2. The <u>Environmental Baseline</u> component refers to designated critical habitat in the action area, without the consequences to the designated critical habitat caused by the proposed action. The environmental baseline includes the past and present impacts of all federal, State, or private actions and other human activities in the action area, the anticipated impacts of all proposed federal projects in the action area that have already undergone formal or early section 7 consultation, and the impact of State or private actions which are contemporaneous with the consultation in process. The impacts to designated critical habitat from federal

agency activities or existing federal agency facilities that are not within the agency's discretion to modify are part of the environmental baseline.

3. The Effects of the Action component evaluates all direct and indirect effects of an action on the species or critical habitat, together with the effects of other activities that are interrelated or interdependent with that action, that will be added to the environmental baseline. The environmental baseline includes the past and present impacts of all Federal, State, or private actions and other human activities in the action area, the anticipated impacts of all proposed Federal projects in the action area that have already undergone formal or early section 7 consultation, and the impact of State or private actions which are contemporaneous with the consultation in process. Indirect effects are those that are caused by the proposed action and are later in time, but still are reasonably certain to occur. Interrelated actions are those that are part of a larger action and depend on the larger action for their justification. Interdependent actions are those that have no independent utility apart from the action under consideration.

4. The Cumulative Effects component evaluates those effects of future State or private activities, not involving federal activities, that are reasonably certain to occur within the action area of the federal action subject to consultation.

In determining whether an action is likely to result in destruction or adverse modification of designated critical habitat, the action is viewed against the aggregate effects of everything that has led to the status of the designated critical habitat and, for non-federal activities, those things likely to affect the designated critical habitat in the future (USFWS and NMFS 1998).

In accordance with 50 CFR 402.14(g), the Service is responsible for (1) reviewing all relevant information provided by the federal agency or otherwise available; (2) evaluating the current status and environmental baseline of the critical habitat; (3) evaluating the effects of the action and cumulative effects on the critical habitat; and (4) adding the effects of the action and cumulative effects to the environmental baseline and in light of the status of the critical habitat, and (5) formulating the Service's opinion as to whether the action is likely to result in the destruction or adverse modification of critical habitat.

3 STATUS OF THE SPECIES AND CRITICAL HABITAT

3.1 Status of the Steller's Eider

The Steller's eider (anarnissakuq/caqiar(aq) in Central Yup'ik, Igniquaqtuq in Inupiaq, Aglekesegak in Saint Lawrence Island Yupik, Latin *Polysticta stelleri*) is a small sea duck with circumpolar distribution and is the sole member of the genus *Polysticta*. The Steller's eider is divided into Atlantic and Pacific populations, which have limited, if any overlap (USFWS 2025*b*). The Pacific population is further subdivided into the Russia-breeding and Alaska-breeding populations, which mix together in molting and wintering areas. This collective population is also known as the "Pacific-wintering population." Alaska-breeding Steller's eiders represent approximately 1 percent of the Pacific-wintering population (Hodges and Eldridge 2001).

The Alaska-breeding population of Steller's eider consists of two breeding subpopulations, referred to as the northern and western Alaska subpopulations. In Alaska, Steller's eiders now breed almost exclusively in the northern subpopulation (i.e., on the Arctic Coastal Plain). The western Alaska subpopulation, which historically occurred on the coastal fringe of the Yukon-Kuskokwim Delta, is considered nearly extirpated (USFWS 2025*b*).

Steller's eider breeding plumage is sexually dimorphic (Figure 3). Males are in breeding plumage (Figure 3) from early winter through mid-summer, during which time they have a large, white shoulder patch contrasting with a chestnut breast and belly that darkens centrally, and a black spot on each of their wings. Their head is white to silver with pale green on the lores, a distinctive black spot surrounding the eye, and a dark olive patch flanked by black on the nape. Their neck is black, extending in an arrow shape down their back. The non-breeding male plumage resembles the female but maintains white upper wing coverts. Females, year-round, are dark, mottled brown with a white-bordered, blue wing speculum. Juveniles are dark, mottled brown until fall of their second year when they acquire breeding plumage. Compared to the true eiders (*Somateria* species), the Steller's eider resembles dabbling ducks in size, appearance, and the body-tipping foraging behaviors employed on the tundra breeding grounds (USFWS 2025*b*). During flight, adult Steller's eiders are distinguished from the true eiders by their faster wing beat, small size, blue wing speculum with white border, and (for males only) black back and white belly).

3.1.1 Listing Status

The Alaska-breeding population was recognized as a DPS because it was considered both discrete and significant based on definitions of those terms in Service policy (96 FR 4722). The Alaska-breeding population of Steller's eiders was listed as threatened on July 11, 1997 (62 FR 31748) based on:

1. A substantial contraction of the species' nesting range on the Arctic Coastal Plain and Yukon-Kuskokwim Delta. Steller's eiders on the Arctic Coastal Plain historically occurred east to the Canada border but may have abandoned the eastern Arctic Coastal Plain in the decades leading up to listing (USFWS 2002*a*, USFWS/Obritschkewitsch and Martin 2002). Steller's eiders historically occurred on the coastal fringe of the Yukon-Kuskokwim Delta and were a common breeding bird at Kokechik Bay in 1924 (62 FR 31748), with low numbers of nests also reported in southwestern Alaska, the Seward Peninsula, and St. Lawrence Island prior to 1960 (62 FR 31748).
2. Reduced numbers of Steller's eiders nesting in Alaska; and
3. Resulting vulnerability of the remaining Alaska-breeding population to extirpation (USFWS/Trust et al. 1997).

Figure 3. Male and female Steller's eiders in breeding plumage.

In 2001, the Service designated 2,830 m^2 (7,330 km^2) of critical habitat (see section 3.2) for the Alaska-breeding population of Steller's eiders that includes: historical breeding areas on the Yukon-Kuskokwim Delta; molting and staging areas in the Kuskokwim Shoals and Seal Islands; molting, wintering, and staging areas at Nelson Lagoon and Izembek Lagoon (USFWS/Obritschkewitsch and Martin 2001). No critical habitat has been designated for Steller's eiders on the Arctic Coastal Plain.

3.1.2 Life Cycle and Distribution

Steller's eiders spend most of their lives in the marine environment, only occupying terrestrial habitats during the breeding season. During the non-breeding season, Steller's eiders use two habitat types: shallow, nearshore intertidal sand flats and mudflats and rocky or mud-bottomed, deepwater but nearshore areas (USFWS 2025*b*). Expansive eelgrass beds, such as those found at Izembek Lagoon and other areas on the north side of the Alaska Peninsula and Kuskokwim Shoals, are used by large numbers of Steller's eiders during the fall molt and staging period and during spring migration staging (Fredrickson 2001). Steller's eiders associate with eelgrass communities during a large portion of their annual cycle, demonstrating it is an important habitat factor (USFWS 2025*b*).

The Alaska-breeding population of Steller's eider winters in marine habitats in southwest Alaska, along with most of the Pacific Russia-breeding population (Figure 4). There is limited information on migratory movements of Steller's eiders in relation to nesting areas, and it remains unclear where the Pacific Russia- and Alaska-breeding populations converge and diverge during their fall molt and spring migrations (USFWS 2025*b*). Because we cannot distinguish between Alaska-breeding and Pacific Russia-breeding birds away from the nesting areas – and because band recovery, tracking, and genetic data suggest Alaska-breeding and Pacific Russia-breeding birds intermix in southwest Alaska – we assume data on distribution and habitat use by Steller's eiders in the combined Pacific wintering population applies to the Alaska-breeding population during the molting, wintering, and spring staging periods (USFWS 2025*b*).

3.1.2.1 Breeding and Post-breeding

Steller's eider nesting is concentrated in tundra wetlands near Utqiaġvik (Figure 44) and occurs at lower densities elsewhere on the Artic Coastal Plain, from Wainwright east to the Sagavanirktok River (Quakenbush et al. 2002, USFWS 2025*b*). Steller's eiders arrive in small flocks of breeding pairs on the Arctic Coastal Plain in late May to early June (USFWS 2025*b*). They typically initiate nesting in mid-June; but timing of nest initiation is affected by timing of snowmelt, which varies annually (USFWS 2024). Egg hatching typically occurs from mid-July through early August, after which females move their broods to adjacent ponds with emergent vegetation and rear their broods to fledge, which occurs 32 to 36 days post hatch (Quakenbush et al. 2004, USFWS/Safine 2011).

Upon leaving the nesting areas, Steller's eiders are observed on the tundra and along the Chukchi and Beaufort Sea coasts near Utqiaġvik (USFWS/Obritschkewitsch and Martin 2001, USFWS/Rojek 2006), where they rest and forage in freshwater and marine habitats prior to fall migration. Timing of departure from nesting areas differs between sexes and varies depending on reproductive success. In years with relatively high breeding effort, flocks of Steller's eiders are primarily comprised of males that remain in the area until the second week of July. From mid-July to early August, flocks with a higher proportion of females (presumably failed breeders) are observed on the tundra and along the Chukchi and Beaufort Sea coasts near Utqiaġvik (USFWS/Obritschkewitsch and Martin 2001, USFWS/Rojek 2006). Females with successfully fledged broods depart the nesting areas in late August to mid-September (USFWS/Safine 2012) and are often observed resting and foraging in freshwater and marine habitat near Point Barrow. During this period, marked Steller's eiders and broods have been observed to frequent areas traditionally used for subsistence waterfowl hunting (USFWS/Safine 2012, Rosenberg et al. 2014, Martin et al. 2015). In years with low breeding effort, flocks are composed of both sexes, and birds depart earlier than in nesting years (Quakenbush et al. 2004; J. Bacon, North Slope Borough Department of Wildlife Management, pers. comm.).

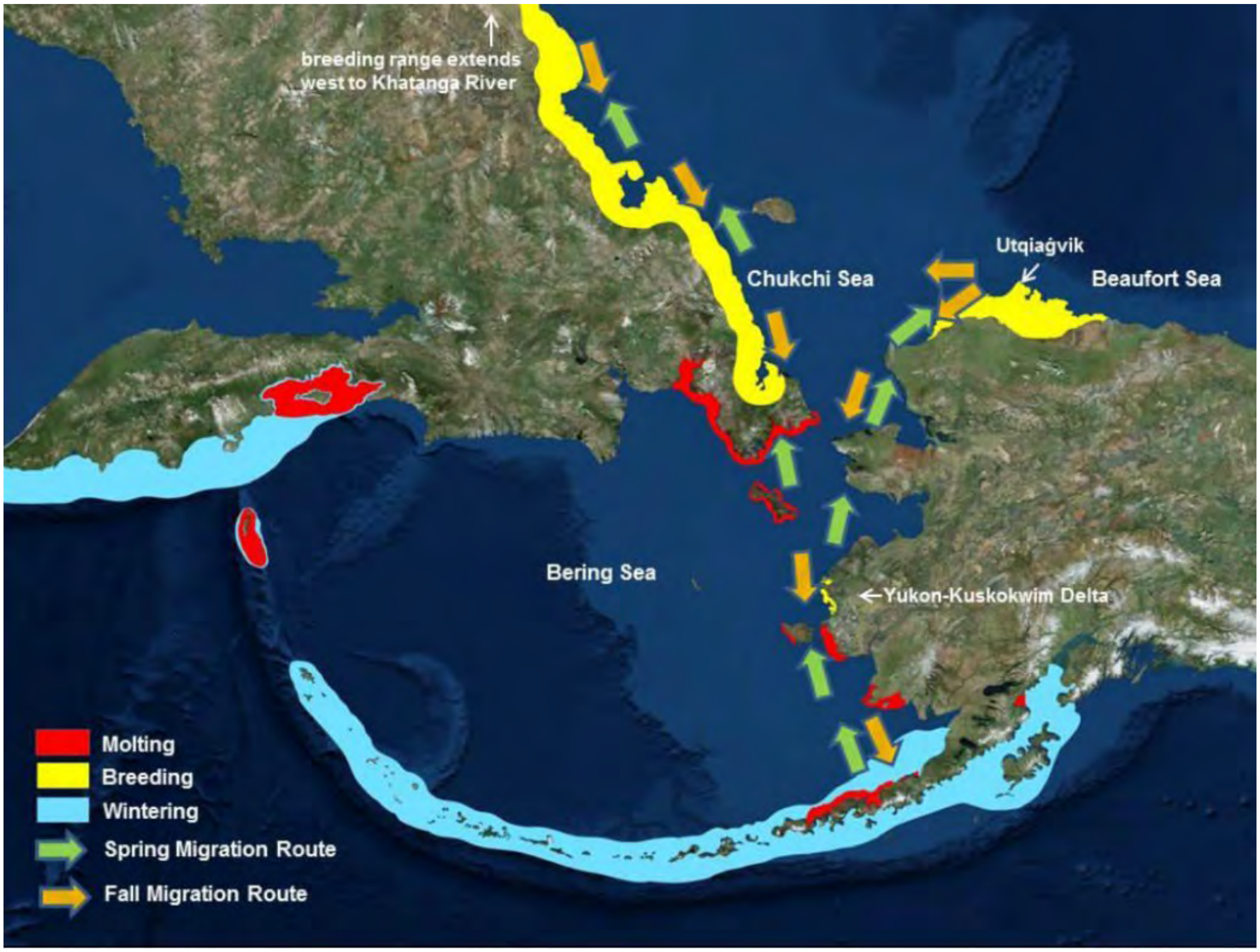


Figure 4. Distribution of the Pacific population of Steller's eider in marine waters of the Bering, Chukchi, and Beaufort Seas and on tundra breeding areas of Russia and Alaska. Figure from (USFWS 2025b).

3.1.2.2 Fall Migration and Molt

Following the post-breeding rest and foraging period, Steller's eiders depart from the nesting areas and migrate along the Chukchi Sea coast to southwest Alaska in a protracted fall migration. Specific data on areas used during "molt migration" (i.e., migration from nesting areas to molting areas) in Steller's eiders is limited to one study (Martin et al. 2015), which tracked thirteen Steller's eiders (7 males, 6 females) from the Alaska nesting areas in 2000 and 2001. Most stopover locations (greater than 95 percent) for these tracked individuals were in nearshore marine waters within 3 mi (5 km) of the coastline, with primary molt migration stopover sites along the north coast of Chukotka, Russia (56 percent), the Bering Strait region (20 percent), the Chukchi Sea coast of Alaska (19 percent), and the Yukon-Kuskokwim River Delta (5 percent). A recent survey suggests Kuskokwim Shoals may be an important fall stopover site for birds molting farther south (USFWS 2025*b*).

Upon arrival to the molting areas, Steller's eiders undergo a complete remigial (i.e., flight feather) molt, rendering them flightless, for a period of three weeks to greater than one month

(Petersen 1980; T. Hollmén, Alaska Sealife Center, pers. comm. 2018). Molting Steller's eiders also have an impaired diving capacity (Howell et al. 2003, Savard and Petersen 2015). Sub-adult Steller's eiders are the first to undergo molt, with numbers peaking in early August based on observations at Nelson Lagoon (Petersen 1980). Timing of molt in adult Steller's eiders coincides with arrival to molting areas: males arrive to molting areas first in late August (Petersen 1980), followed by unsuccessful breeding and non-breeding females, then successful females and broods (Rosenberg et al. 2014, Martin et al. 2015). The timing of molt in female Steller's eiders varies annually based on breeding success; thus, the sex and age ratio of Steller's eiders at molting areas varies within the season and among years (USFWS 2025*b*). Generally, the Steller's eider molting period may begin in late July and continue through October.

In waterfowl, molting site selection is assumed to be partially driven by availability of energy-dense prey with high protein content (which is limited relative to other nutrients in most environments) and reduced survival risk, including through refugia from predators (Hohman et al. 1992). During the flightless period, Steller's eiders prefer shallow, protected lagoons, embayments, and estuaries that include eelgrass beds and intertidal mud and sand flats (Petersen 1981, Laubhan and Metzner 1999, Dau et al. 2000). In areas with expansive eelgrass beds, large numbers (i.e., tens of thousands) of eiders aggregate in dense flocks, using deep channels close to shore (Dau et al. 2000, USFWS/Williams et al. 2016). Steller's eiders typically form single-species flocks but periodically form mixed-species flocks with Pacific common eiders (*S. mollisima v. nigrum*), mergansers (*Mergus spp.*), and black scoters (*Melanitta americana*) (USFWS/Williams et al. 2016). They were also seen mixed into or near brant flocks during surveys conducted in Izembek Lagoon in October 2025 (A. Williams, USFWS, pers. comm. 2026*a*). The shelled prey Steller's eiders consume during the molting period is eelgrass-associated (Metzner 1993), and shallow waters support their specific feeding ecology (see section 3.1.2.5).

Primary, traditional molting areas for the Pacific-wintering population of Steller's eiders include Izembek Lagoon, Nelson Lagoon, Port Heiden, and Seal Islands on the north side of the Alaska Peninsula (Petersen 1981, USFWS/Wilk et al. 1986, Rosenberg et al. 2014), as well as the Kuskokwim Shoals in northern Kuskokwim Bay (Dau 1987, Rosenberg et al. 2014, Martin et al. 2015, USFWS 2025*b*); see section 3.2, Critical Habitat. Smaller numbers have also been reported around islands in the Bering Sea, along the coast of Bristol Bay including near Cape Peirce, and in smaller lagoons along the Alaska Peninsula (USFWS/Dick and Dick 1971, Petersen and Sigman 1977, USFWS/Wilk et al. 1986, Dau 1987). Smaller numbers of Steller's eiders (numbering hundreds to low thousands) have been documented molting outside the Alaska Peninsula (USFWS/Larned 2006, Rosenberg et al. 2014), Martin et al. 2015). At least some individuals have a high degree of molting site fidelity to specific lagoons in subsequent years, as shown by studies at Izembek and Nelson Lagoons (95 percent or greater site fidelity; Flint et al. 2000) and by data derived from a small sample of individual birds tracked from wintering areas near Kodiak Island (Rosenberg et al. 2014). There is no evidence the two breeding populations (Alaska-breeding and Pacific Russia-breeding) segregate in the molting areas along the Alaska Peninsula (Dau et al. 2000, Pearce et al. 2005).

A recent survey (i.e., fall 2016) at historically important molting sites along the Alaska Peninsula recorded 99 percent of molting Steller's eiders in the Seal Islands and Nelson and Izembek

Lagoons (USFWS/Williams et al. 2016). This survey found reduced numbers of Steller's eiders in these traditional molting, particularly Nelson Lagoon but also the Izembek Complex, compared to the recent mean (the 2016 estimate was 25 percent lower than the mean for the period 2012 to 2015; (USFWS/Williams et al. 2016). The reason behind reduced numbers in these traditional sites are unclear but could suggest a potential change in molting distribution and/or may represent a decline in the Pacific-wintering population (Hollmén et al. 2022, Maliguine et al. 2025, USFWS 2025*b*).

3.1.2.3 Wintering

Some of the Pacific-wintering Steller's eiders disperse to rocky, intertidal areas or deeper, nearshore waters following the completion of molt, including areas on the south side of the Alaska Peninsula, the Aleutian Islands, and the western Gulf of Alaska (King and Dau 1981*a*, USFWS/Larned 2006, Rosenberg et al. 2014, Martin et al. 2015). Flocks of up to thousands of birds will remain in their eelgrass-dominated, intertidal molting lagoon habitats for at least a portion of the wintering period, unless forced out of these habitats by icing conditions (Laubhan and Metzner 1999). The wintering period is defined as January to April but could also be considered to include the period immediately following molt. The Alaska-breeding subpopulation does not appear to preferentially use specific wintering areas (Dau et al. 2000, Pearce et al. 2005), including as evidenced from a small sample of birds tracked with satellite transmitting tags (Figure 5; Martin et al. 2015). Individual birds may have some fidelity to specific wintering areas, as suggested by a small sample of satellite transmitter-outfitted birds tracked from wintering sites near Kodiak Island (11 of 12 birds returned to their "original" wintering area in the second winter; Rosenberg et al. 2014). It is possible birds also move between wintering sites; most birds tracked in the Martin et al. 2015 study appeared to have a primary and a secondary wintering site, which were discrete and relatively small compared to the broad wintering distribution (Martin et al. 2015).

Wintering Steller's eiders usually occur in shallow waters (less than 33 ft [10 m] deep) within 1,300 ft (400 m) of shore but can be found farther offshore where shallows extend beyond this distance (e.g., in areas of bays, lagoons, and reefs; (USFWS 2002*b*). Substantial use of habitats greater than 33 ft (10 m) deep has been reported during mid-winter, which may reflect nocturnal rest periods or shifts in availability of food resources (Petersen 1980, Martin et al. 2015) and may be related to freezing conditions forcing a shift to deeper, ice-free waters (Laubhan and Metzner 1999). Pair bonding and courtship behavior begins in late winter and is completed prior to departure to the breeding grounds (Fredrickson 2001, Martin et al. 2015).

3.1.2.4 Spring Migration

The majority of the global population of Steller's eiders migrates along the Bristol Bay coast of the Alaska Peninsula in the spring (i.e., April and May), traveling from their wintering areas to breeding grounds in Russia or Alaska and stopping en route to feed at the mouths of lagoons and other productive habitats (USFWS 2025*b*). Birds stage in these productive habitats while waiting on farther north habitats along the migration corridor and in the nesting areas to thaw (King and Dau 1981*a*). Historically, aggregations of Steller's eiders at spring staging areas along the Bristol Bay coast of the Alaska Peninsula were observed at Nelson Lagoon, Izembek Lagoon, and

Bechevin Bay and numbered approximately 200,000 individuals combined at peak (Jones 1965). Birds moved between these three sites annually depending on ice conditions, with typically half aggregated at Nelson Lagoon and the other half split between Izembek Lagoon and Bechevin Bay (Jones 1965). In 2012, a spring survey along the Alaska Peninsula counted approximately 60,000 Steller's eiders, and an annual decline of 2.4 was assessed in spring-staging eiders during the period 1992 to 2012 (USFWS/Larned 2012*a*).

The spring migration of Steller's eiders is characterized by frequent stopovers at coastal locations (Rosenberg et al. 2014), although some birds may make straight line crossings of water bodies such as Bristol Bay (USFWS/Larned 1998). In a small sample of satellite-tracked birds, the majority first staged in estuaries along the north coast (i.e., Bristol Bay side) of the Alaska Peninsula or lower Cook Inlet (Rosenberg et al. 2014); after leaving the Alaska Peninsula, tracked birds staged for extended periods at Kuskokwim Shoals (Rosenberg et al. 2014, Martin et al. 2015); Figure 5).

Steller's eiders congregate in staging areas in large numbers to feed in ice-free habitats before continuing northward, showing strong site fidelity to specific areas (USFWS/Larned 1998, Martin et al. 2015). Areas known to receive consistent use by Steller's eiders during spring migration include Bechevin Bay, Morzhovoi Bay, Izembek Lagoon, Nelson Lagoon/Port Moller Complex, Cape Seniavin, Seal Islands, Port Heiden, Cinder River State Critical Habitat Area, Ugashik Bay, Egegik Bay, Kulukak Bay, Togiak Bay, Nanwak Bay, Kuskokwim Bay, Goodnews Bay, and the south side of Nunivak Island (USFWS/Larned et al. 1993, USFWS/Larned 1998, 2000). Steller's eiders likely use spring leads for feeding and resting as they move northward, although there is little information on distribution or habitat use after departure from spring staging areas. Food availability at spring staging areas plays a key role in reproductive capability of Steller's eiders, and having access to a series of specific foraging locations along their northward route is likely important for maintaining adequate physiological condition (USFWS 2025*b*).

3.1.2.5 Non-Breeding Summer Distribution in Southern Alaska

A small number of Steller's eiders are known to remain along the Alaska Peninsula and in Kachemak Bay during the summer months; approximately 100 Steller's eiders have been observed in Kachemak Bay, and a few individuals may spend the summer at Izembek Lagoon (Chris Dau, USFWS, unpublished data).

Figure 5. Distribution of Alaska-breeding Steller's eiders during the non-breeding season, based on locations of 13 birds implanted with satellite transmitters in Utqiaġvik, Alaska, during June 2000 and June 2001. Marked locations include those at which a bird remained for at least 3 days. Onshore summer use areas comprised locations that birds departed Utqiaġvik, apparently without attempting to breed in 2001 (USFWS 2002*b*).

3.1.2.6 Non-Breeding Foraging Ecology and Diet

Steller's eiders appear to have low flexibility in their foraging ecology, which may be constrained by their diving physiology (they use the same, shallow habitats throughout the molting period and the winter) or bill morphology (USFWS 2025*b*). Despite this, outside of the remigial molting period, Steller's eiders forage on a wide selection of food items, and diet appears to be based on prey availability (Metzner 1993, Fredrickson 2001). Their diet includes diverse taxa belonging to four main invertebrate groups found throughout the water column (i.e., between the water surface and the benthos): *Crustacea*, *Bivalvia*, *Gastropoda*, and *Polychaeta* (Petersen 1980, Metzner 1993). Like other small-bodied sea ducks, Steller's eiders daily consumption of prey equates to a high percentage of their own body mass (Ouellet et al. 2013).

During the molting period, Steller's eiders increase their consumption of bivalves and other shelled prey (e.g., gastropods) relative to soft-bodied crustacean prey (e.g., amphipods; (Petersen 1980, Troy and Johnson 1989, Metzner 1993) and consume larger prey than is commonly available in local substrate (Petersen 1980). Molt is energy-demanding, and waterfowl such as eiders that undertake simultaneous remigial molt may be nutritionally stressed during this period (Hohman et al. 1992, Howell et al. 2003, Savard and Petersen 2015). Bivalves and gastropods are more energy dense than other common macroinvertebrates used by Steller's eiders (e.g., amphipods), suggesting Steller's eiders could be limited or specialized in their diet during this stage of their annual cycle, focusing on prey with relatively higher energy content to meet necessary energetic requirements (Petersen 1981, USFWS 2025*b*).

Birds that are flightless during their molting periods are limited to the available prey at their molting sites. Therefore, Steller's eiders require molting sites with abundant and high-quality prey (USFWS 2025*b*). Because prey accessibility is also important, Steller's eiders prefer shallow lagoons and embayments with eelgrass beds and intertidal mud and sand flats, where they forage primarily at low tide (Petersen 1981) and close to shore (Dau et al. 2000, USFWS/Williams et al. 2016). The invertebrate community on which Steller's eiders rely, throughout the water column and benthos, is an important component of critical habitat in the non-breeding areas (see section 4.3).

3.1.3 Populations and Trends

Available data suggest that very few Steller's eiders, perhaps tens of individuals, breed in western Alaska (i.e., on the Yukon-Kuskokwim Delta; USFWS 2019). The western Alaska sub-population is considered nearly extirpated (USFWS 2025*b*). Therefore, the population of Alaska-breeding Steller's eiders primarily consists of individuals breeding in northern Alaska (i.e., on the Arctic Coastal Plain), with the number of Steller's eiders breeding annually on the Arctic Coastal Plain being low and highly variable, and the highest densities near Utqiaġvik. The mean number of Steller's eiders present on the Arctic Coastal Plain from 2007 to 2024 is estimated as 406 Steller's eiders (95 percent CI = 207.67 – 750.02; see section 4.1.3.1 and (USFWS 2025*b*).

Methods to estimate the abundance of the listed Alaska-breeding population of Steller's eiders are limited to surveys of breeding pairs because Alaska-breeding Steller's eiders cannot be distinguished from Pacific Russia-breeding Steller's eiders when the subpopulations are intermixed. This contributes to uncertainty in the size of the listed population: the proportion of Alaska-breeding Steller's eiders present on the breeding grounds may vary annually, and their breeding propensity also appears to vary considerably (USFWS 2025*b*).

3.1.3.1 Arctic Coastal Plain Subpopulation

Three, ongoing surveys monitor the number of Steller's eiders present on the Arctic Coastal Plain annually: the Arctic Coastal Plain Waterfowl Breeding Population Survey (Arctic Coastal Plain Survey), the Utqiaġvik Triangle Survey, and the Utqiaġvik Ground-based Breeding Pair Survey (Utqiaġvik Ground Survey). Design and caveats of each survey are described in detail in the Steller's Eider Species Status Assessment (USFWS 2025*b*).

The Arctic Coastal Plain Survey covers the largest portion of the range of Steller's eiders in northern Alaska (22,139 m^2 [57,339 km^2]) but has low sampling coverage (varying between 1 and 8 percent among strata during 2007 to 2019 and 2022 to 2024) and a small number of Steller's eider observations each year (USFWS 2025*b*). The highest density of observations occurs in the northwestern region of the Arctic Coastal Plain, near Utqiaġvik (Figure 6). Two surveys provide more intensive coverage of the Steller's eider nesting range in northern Alaska containing the highest densities of breeding birds: the aerial Utqiaġvik Triangle Survey and the complementary Utqiaġvik Ground Survey. The Utqiaġvik Triangle Survey provides coverage of 25 to 50 percent of a 1,034 to 1,065 m^2 (2,677 to 2,757 km^2) area, from just south of the community of Utqiaġvik to the Meade River (conducted 1999 to 2019 and 2021 to 2023). The Utqiaġvik Ground Survey has nearly 100 percent spatial coverage of the 52 m^2 (134 km^2) study area surrounding the Utqiaġvik road system. The Utqiaġvik Ground Survey counts the number of male Steller's eiders (assumed to be associated with a more cryptic and sometimes unobserved female) prior to and during nest initiation and monitors nest fate (detection is not estimated).

The Service's most recent estimate of the population size of the Alaska-breeding Steller's eider uses a negative binomial, spatiotemporal generalized additive model (GAM), incorporating survey data from the two aerial surveys: the Arctic Coastal Plain Survey and Utqiaġvik Triangle Survey (USFWS 2025*b*). The GAM-estimated mean number of Alaska-breeding Steller's eiders, estimated across the period 2007 to 2024, is 406 Steller's eiders (95 percent CI = 207.67 – 750.02; (USFWS 2025*b*). The estimate includes: a predicted mean estimate of birds occurring across the Arctic Coastal Plain but outside the Utqiaġvik Triangle Survey area (n = 152 eiders; 95 percent CI = 59.19 – 340.67; years 2007 to 2024) and an estimated average annual number of birds occurring in the Utqiaġvik Triangle Survey area (n = 213 eiders; 95 percent CI = 123.7 – 403.1, years 1999 to 2023). Over half of the Steller's eiders estimated by the spatiotemporal GAM occur within the combined area covered by Utqiaġvik Triangle Survey and road system survey. For comparison, the Utqiaġvik Ground Survey provides an index of Steller's eider abundance in the high-density breeding habitat around the road system. The mean annual number of nesting Steller's eiders (i.e., the count of observed males multiplied by two) estimated in the road system survey area is 101 (SD = 78, range = 0 – 264; USFWS 2025*b*).

The GAM suggests the Alaska-breeding Steller's eider population undergoes cyclical patterns of abundance, fluctuating between short periods of increases and decreases, with an approximate

6.5-year period. Overall, the long-term population trend suggests an increasing or slightly decreasing population, depending on the time interval analyzed (USFWS 2025*b*).

The proportion of the overall Arctic Coastal Plain subpopulation that breeds in any given year varies. Thus, some unknown number of Alaska-breeding Steller's eiders are not available to be detected in the surveys every year. Non-breeding birds may remain in marine areas, stage in other terrestrial areas prior to molt, or visit nesting areas of the Arctic Coastal Plain briefly before moving back to marine habitat. It is possible some birds nest in Russia in years when they are not present in Alaska. However, although information on breeding site fidelity of Steller's eiders is limited, analysis using genetic mark-recapture techniques and recapture of nesting eiders both suggest breeding site fidelity is high (Safine et al. 2020, USFWS unpublished data).

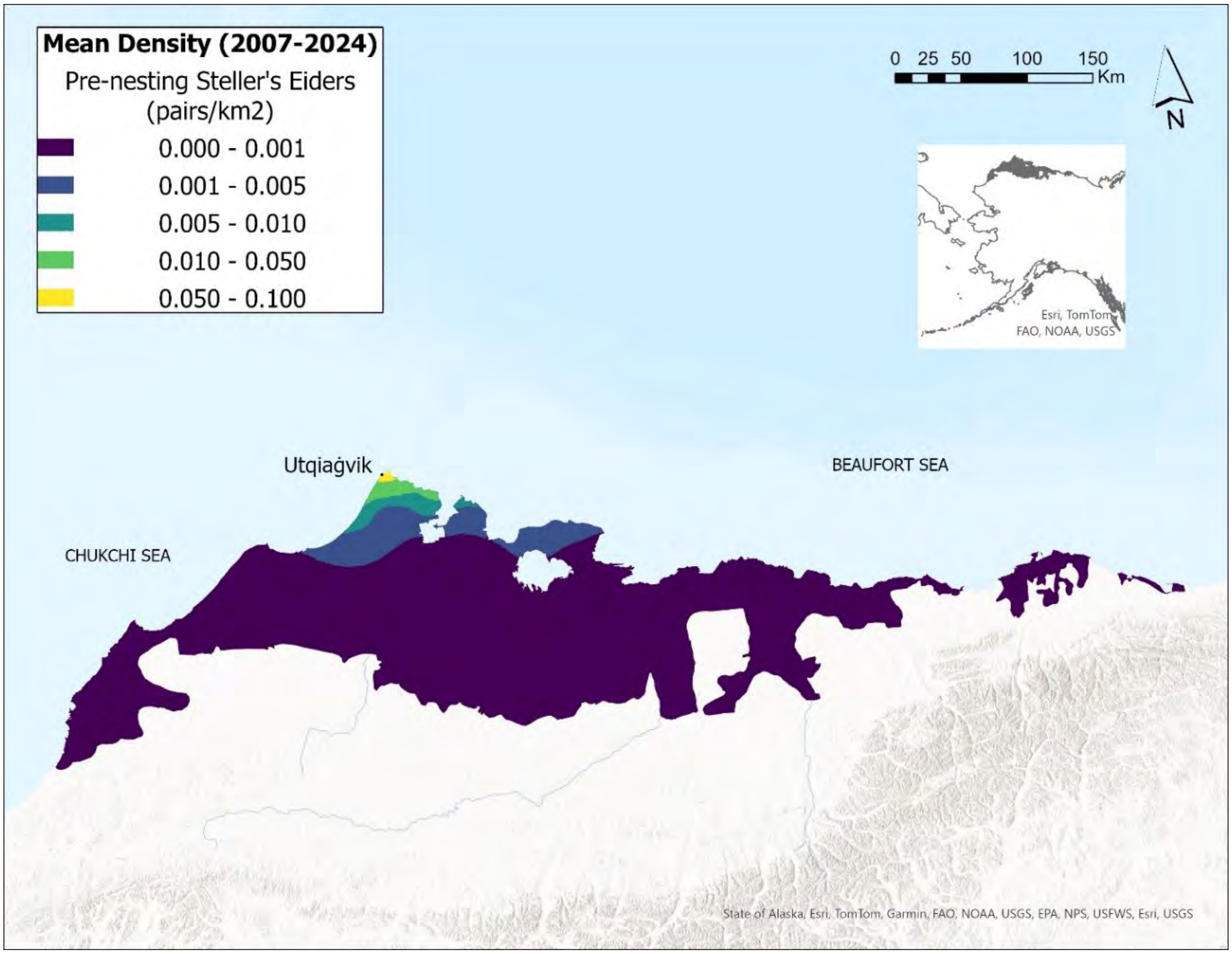


Figure 6. Average predicted densities of pre-nesting Steller's eider pairs across the aerial ACP Survey area, June 2007 to 2024 (USFWS 2025*b*). Data are not corrected for incomplete detection.

3.1.3.2 Yukon-Kuskokwim Delta Subpopulation

Historical observations of nesting Steller's eiders have been recorded in western and southwestern Alaska, including the Alaska Peninsula, the Seward Peninsula, St. Lawrence Island, and Agattu Island (62 FR 31748). However, contemporary observations (i.e., 1960s to present) of breeding Steller's eiders in the "western" subpopulation are limited to the central coastal zone of the Yukon-Kuskokwim Delta (USFWS 2025*b*).

The Service has conducted three breeding waterfowl surveys annually on the Yukon-Kuskokwim Delta. These include two aerial surveys, the Waterfowl Breeding Population and Habitat Survey (1957 to 2024) and the Alaska Yukon-Kuskokwim Delta Aerial Breeding Pair Survey (1985 to 2024), and one ground survey aimed at estimating the number of waterfowl nests on the central coast (1985 to 2019, 2022).

Only four Steller's eiders have been recorded during aerial surveys from 1988 to 2023: three were observed in 1988, and one lone male was recorded near the Manokinak River in 2018 (observation from J. Fischer, USFWS, pers. comm.). During ground (i.e., nest plot) surveys and other avian research conducted from 1997 to 2023, there have been observations of 62 adult Steller's eiders, plus 12 nests and 1 brood (Flint and Herzog 1999, USFWS 2025*b*), USFWS unpubl. data). Observations of adults have consisted of pairs and lone males in wetland habitat and singles and pairs flying by along a river or the coast; nests were found at Kigigak Island and near the Tutakoke and Kashunuk Rivers (USFWS 2025*b*). When the species was listed in 1997, no Steller's eider nests had been found on the Yukon-Kuskokwim Delta for approximately 20 years (since 1975; Kertell 1991).

Field research is conducted sporadically throughout the central coastal zone of the Yukon-Kuskokwim Delta by the Service, the U.S. Geological Survey, universities, and other entities. Incidental observations of Steller's eiders would likely be recorded and reported during these activities, as mandated by Yukon Delta Refuge research permits and given the species' rarity and resulting interest in the species (USFWS 2025*b*). The small number of Steller's eider observations in nesting habitat over many years, despite substantial research and activity, suggests that Steller's eiders breeding in this region of Alaska remain rare. Given the small number of observations, it is not possible to estimate a trend in subpopulation abundance since listing (USFWS 2025*b*).

3.1.3.3 Importance of the Pacific Russia-Breeding Population

The population size of the non-listed Pacific Russia-breeding population of Steller's eiders is currently unknown, and the total size of the larger Pacific-wintering population and its overall trend are difficult to estimate with the available data (C. Bradley, USFWS, pers. comm. 2017). Historically, 200,000 Steller's eiders were estimated to "winter" along the Alaska Peninsula, considered to be the primary non-breeding region for the Pacific-wintering population (Jones 1965); by 1979, Steller's eiders along the Alaska Peninsula numbered 135,000 (Petersen 1981), and by 1991, less than 65,000 Steller's eiders were counted in this region during the non-breeding season (Kertell 1991). In the contemporary dataset, separate surveys have counted birds belonging to the Pacific-wintering population during either spring staging or fall molt. Steller's eiders staging in spring along the western and southwest coast of Alaska, from the Yukon Delta to the Alaska Peninsula, ranged from a high count of 134,904 Steller's eiders in 1992 to a low count of 54,888 Steller's eiders in 2010 (mean of 81,453, 1992 to 2012; USFWS/Larned 2012*a*). Surveys along the Alaska Peninsula during the fall molting period in 2012 to 2016 counted birds in the range of 30,407 to 70,320 Steller's eiders (mean of 50,926; USFWS/Williams et al. 2016).

The abundance and productivity of the Pacific Russia-breeding population may be highly important for the listed Alaska-breeding population if there is a high rate of exchange between the two (USFWS 2025*b*). There is observed genetic differentiation between Alaska- and Pacific Russia-breeding populations but also evidence of gene flow, which is predominantly male-mediated (Pearce et al. 2005). The listed population is dependent to some degree on the Pacific Russia population for a source of males with whom Alaska-breeding females can form pair bonds when they are co-located on the wintering grounds, and some number of females originating from the Pacific Russia-breeding population may immigrate to the Alaska-breeding population annually and vice versa (USFWS 2025*b*). Thus, immigration from the non-listed population may be a source of recruits for the Alaska-breeding population. Although we have some evidence of female breeding site fidelity and natal philopatry in the Utqiaġvik study area (see section 3.1.2.1 and USFWS 2025*b*), the amount of immigration that occurs or its importance to the Alaska-breeding population's growth rate is difficult to quantify. However, movement of individuals could be influenced by the size of the Russia-Pacific breeding population and its demographic rates, and therefore the abundance and productivity of the Russia-Pacific breeding population may ultimately affect the resilience of the Alaska-breeding population (USFWS 2025*b*).

3.1.3.4 Demographic Rates

Annual survival probability of Steller's eiders in the Pacific-wintering population has estimated using mark-recapture data from banded, molting Steller's eiders. In an analysis using data from birds captured at Izembek Lagoon during the years 1993 to 2006, apparent female survival probability was estimated as 0.86 (SE = 0.03) and apparent male survival probability as 0.87 (SE = 0.18; (Frost et al. 2013). The magnitude and direction of bias in these estimates is unknown, but the data on which these estimates are based have important caveats (USFWS 2025*b*): birds included in this analysis consisted of non-breeding and failed females, as successful females and their broods had not yet arrived at Izembek Lagoon during the capture period; the population sampled was the Pacific-wintering population, which is dominated by Russia-breeding birds, and it is unknown how applicable these estimates are to the Alaska-breeding population; and finally, the model from which these apparent survival estimates are derived does not distinguish between permanent emigration and mortality.

Two models suggest the northern subpopulation of the Alaska-breeding Steller's eider has lower survival than the Pacific-wintering population. Apparent survival was estimated for nesting female eiders captured in the Utqiaġvik area, again using mark-recapture data. During the years 1995 to 2016, apparent female survival probability was estimated as 0.78 (SE = 0.06;(Safine et al. 2020). The Safine et al. 2020 model provides the only direct estimate of annual apparent survival rate of Steller's eiders in the Alaska-breeding population; but once again, the model from which this apparent survival estimate is derived does not distinguish between permanent emigration and mortality (USFWS 2025*b*). In a separate analysis using the aerial Arctic Coastal Plain Survey data and a Bayesian state-space model framework, adult female survival probability was estimated as 0.754 (SD = 0.015; (Dunham and Grand 2017); this estimate falls within the 95 percent confidence interval given by the Safine et al. 2020 model.

A decrease in adult survival through time is thought to have contributed toward a long-term population decline in the Pacific-wintering population: based on birds captured on the Alaska Peninsula, there was an apparent decrease in survival from the period 1975 to 1981 (female survival = 0.946, SE: +/- 0.059; male survival = 0.874, SE: +/- 0.062); to the period 1991 to 1997 (female survival = 0.899, SE: +/- 0.032; male survival = 0.765, SE: +/- 0.044), (Flint et al. 2000). Adult survival on the wintering grounds has also been hypothesized as a contributing factor behind the decline of Steller's eiders at some European wintering sites (i.e., birds belonging to the Atlantic Russia-breeding population (Žydelis et al. 2006). Assuming Steller's eiders have a similar life history to other sea ducks, adult female survival may have a disproportionate impact on population growth rate compared to demographic parameters related to productivity (Flint 2015). The Service has assessed improving adult female survival as important to species recovery and reducing threats and protecting habitat in both breeding and non-breeding areas are identified as needed (USFWS 2021*a*).

Breeding propensity in Alaska-breeding Steller's eiders is highly variable: from 1991 to 2023, the number of nests found in the core nesting area ranged from 0 – 78 annually. Mean apparent clutch size during this period was 5.7 (range 4.8 – 6.6; SD = 1.17), and mean nest survival probability was 0.28 (SE of annual point estimates = 0.05; nest survival is defined as at least one egg hatched). Additional demographic information, including on productivity parameters (i.e., brood survival), can be found in the Species Status Assessment (USFWS 2025*b*).

3.1.4 Threats

Upon listing the Alaska-breeding population of Steller's eiders, the Service hypothesized that changes in the Bering Sea, where Steller's eiders molt and winter, and ingestion of lead shot on the Yukon-Kuskokwim Delta may have contributed to range contraction. Habitat destruction, overharvest, inadequacy of regulatory mechanisms, disease, and predation were not suspected to be factors (USFWS 2025*b*). The first iteration of the species' recovery plan identified additional stressors that may have affected current condition of the Alaska-breeding Steller's eider: increased predation pressure, hunting, exposure to oil or other contaminants near fish processing facilities in southwest Alaska, risk of collisions with fishing vessels or lighted structures, disturbance related to human activity near the core nesting area, and loss or alteration of tundra nesting habitat as a result of development (USFWS 2002*b*). The 2002 recovery plan also noted it is likely that unknown stressors in the marine environment were having an impact on the population (USFWS 2002*b*). The most recent species status assessment states the low numbers and restricted breeding range mean the listed population make it vulnerable to many threats, including natural threats such as major storms, disease, and predation (USFWS 2025*b*). The most recent recovery plan notes some threats are more easily addressed than others because they are a direct result of human activity (e.g., shooting, collisions, disturbance) and can be addressed through management actions (USFWS 2021*a*).

3.1.4.1 Habitat Loss and Degradation

Although loss or modification of habitat is not thought to have played a major role in the decline of the Alaska-breeding Steller's eider, habitat changes are considered a threat. Construction related to community infrastructure and industrial development in coastal and marine areas – including activities such as materials (e.g., gravel) extraction, dredging, and construction of roads, pads for homes or other buildings, pipelines, docks, and other infrastructure – destroys and degrades the important terrestrial habitats (i.e., nesting and brood-rearing habitat) and marine habitats (e.g., fall molting, wintering, and spring staging) of Steller's eiders (USFWS 2021*a*).

Development in proximity to villages on the Arctic Coastal Plain, and particularly Utqiaġvik, has impacted measurable quantities of Steller's eider nesting, brood-rearing, and post-breeding habitat (USFWS 2025*b*). Steller's eiders may prefer higher-relief habitats for nesting; and these areas, which are relatively scarce within the Arctic Coastal Plain breeding distribution of Steller's eiders (Miller 2023) are also more desirable for human development. Given the majority of the Arctic Coastal Plain may be of low suitability for Steller's eider nesting (Miller 2023), anthropogenic effects to nesting habitat are not trivial. Furthermore, the impact of infrastructure on ground thermal conditions can strongly enhance ongoing permafrost degradation (see 3.1.4.8), exemplified by degrading permafrost in the location of many of the active industrial sites across the Arctic Coastal Plain (Langer et al. 2023). Habitat loss in the core of Steller's eider nesting habitat is not trivial, but the overall effect of habitat loss near Utqiaġvik on resiliency of the Alaska-breeding population is unknown (USFWS 2025*b*).

Human development in coastal and marine habitats can also result in direct loss of habitats used by Steller's eiders, including through the construction of near-shore infrastructure (e.g., docks, jetties and other revetments), or result in habitat degradation through the indirect effects of development. For example, discharge from commercial seafood processors has become an increasing concern for its potential impacts to marine life, including seabirds and sea ducks. Fish waste from seafood processing plants or municipal sewage outfall could potentially harm Steller's eiders indirectly by degrading foraging habitat, and directly by exposing individuals to contaminants, disease, and increased predation (Reed and Flint 2007, USFWS 2025*b*). Generally, development in marine habitats in Alaska has a small footprint compared to the dispersed distribution of Steller's eiders, but development in important areas used by concentrations of Steller's eiders could have a greater effect to Steller's eiders through impacts to adult survival or through carry-over effects that impact breeding propensity and reproductive success. The overall effect of development in marine habitats is unknown.

3.1.4.2 Anthropogenic Disturbance

Utqiaġvik is an important human population center, and the area surrounding Utqiaġvik is the core of the Steller's eider current breeding distribution in Alaska. Therefore, this area of the Alaska-breeding Steller's eider distribution is disproportionately important to the survival and recovery of the population (USFWS 2025*b*). Human activities in and around Utqiaġvik that may disturb nesting Steller's eiders include the use of existing facilities and roads near nesting areas; on-tundra activities such as subsistence activities, tourism, recreation, and transit through nesting areas including by all-terrain vehicle (ATV), on-tundra aircraft landings, and walking; and low-level flights, including for aerial surveys (USFWS 2021*a*). Field-based, scientific research in Steller's eider nesting areas has increased in response to interest in climate change and its effects on Arctic ecosystems; these activities, including research directed at Steller's eiders, can also result in disturbance to breeding Steller's eiders. Overall, human disturbance during the breeding season can lead to reduced productivity by impacting Steller's eider breeding effort and success. The overall effect of anthropogenic disturbance in and around the core nesting areas near Utqiaġvik is thought to have a moderate effect on the population resiliency of the Alaska-breeding Steller's eider (USFWS 2025*b*).

Human activities in and near coastal and marine habitats may also disturb Steller's eiders during other periods of the annual cycle. At present, disturbance to Steller's eiders in the marine environment primarily results from human activities near coastal communities along the north coast of the Alaska Peninsula, Aleutian Islands, and western Gulf of Alaska (including Kodiak Island and the lower Cook Inlet) during the non-breeding season. Vessels used for shipping, fishing, research, and tourism transit through Steller's eider migration corridors, molting areas, and wintering areas. Steller's eiders are most likely to encounter marine vessel traffic near harbors and fish processing facilities such as those on Kodiak Island and Dutch Harbor (USFWS 2025*b*). Disturbance from hunting activities occurs near Cold Bay and Kodiak Island, areas where high levels of waterfowl sport hunting are known to occur, and throughout the non-breeding distribution during subsistence hunting activities, including bird and marine mammal harvest in areas accessed by hunters from local villages (USFWS 2025*b*). Research activities taking place in areas where Steller's eiders concentrate, including fall and spring aerial surveys at Steller's eider staging areas throughout the Alaska Peninsula, could also result in disturbance. Of greatest concern is vessel traffic or other sources of disturbance in molting areas between August and November, overlapping the period when Steller's eiders undergo their flight-feather molt and have a limited ability to move away from sources of disturbance while also being under higher energetic demands (USFWS 2025*b*).

Projected increases in vessel traffic, industrial development, and other human activities in the Bering, Chukchi, and Beaufort Seas are expected to result in increased levels of disturbance to Steller's eiders. Anthropogenic disturbance in important areas used by concentrations of Steller's eiders could have a greater effect through impacts to adult survival or through carry-over effects that impact breeding propensity and reproductive success. However, the overall effect to the Alaska-breeding population of human activities in marine habitats is unknown.

3.1.4.3 Environmental Contaminants

Steller's eiders can be exposed to contaminants by coming into direct contact with contaminants in the abiotic environment (USFWS 2025*b*) or by ingesting prey items with contaminants in their tissues (Franson 2015). In the tundra nesting areas, the primary contaminant of concern is lead, and the primary source of lead contamination is ingestion of spent shot (i.e., pellets) deposited in in wetlands nesting areas or nearshore marine waters used for foraging (USFWS 2025*b*). Lead shot has been identified as the source of harmfully elevated levels of lead in Steller's eiders (USFWS/Trust et al. 1997, Lovvorn et al. 2013, Miller et al. 2016, 2019, A. Matz, USFWS, pers. comm. 2024). The effects of lead exposure varies, but lethal and sublethal response can occur (Hoffman 1990). Mortality resulting from lead exposure is particularly a concern for breeding females, which may have a greater level of exposure due to longer time spent in the nesting areas. Exposure to lead shot could also occur outside the nesting areas, but data to assess this are limited. Use of lead shot for waterfowl hunting appears to be declining; its use in waterfowl hunting is prohibited nationwide, and in Alaska use of lead shot is prohibited for hunting of all bird species. However, residual lead shot remaining in the environment may be accessible to waterfowl for more than 25 years (Franson et al. 1995, Flint and Schamber 2010). Overall, exposure to lead shot was identified to have a significant, negative effect on population resiliency of the Alaska-breeding Steller's eider (USFWS 2025*b*).

Industrial activities around the globe produce contaminants such as heavy metals (e.g., selenium, mercury, cadmium, copper), hydrocarbons, and persistent organic pollutants and distribute these into the environment through atmospheric, marine, and freshwater pathways (Lovvorn et al. 2013). While Steller's eiders could be exposed to these trace elements on the tundra nesting areas, most exposure probably occurs during the non-breeding season in marine areas (Lovvorn et al. 2013, Miller et al. 2016). They may also be directly exposed to spills of petroleum and other contaminants in marine habitats (USFWS 2002*b*), such as organochlorine pesticides and polychlorinated biphenyls. When the M/V *Selendang Ayu* ran aground and broke apart near Unalaska Island in the Eastern Aleutians and released an estimated 351,246 gallons (1,330 metric tons) of oil and diesel, the spilled product encountered nearshore areas known to be used by Steller's eiders. Although no live or dead Steller's eiders were confirmed oiled during the incident (Byrd and Daniel 2008), they were likely present in the area of the spill and are assumed to have been exposed (Stehn et al. 2008, NOAA et al. 2016). The extent to which Alaska-breeding Steller's eiders and their prey resources were affected is unknown. A study evaluating chronic exposure of harlequin ducks (*Histrionicus histrionicus*) to hydrocarbons associated with the M/V *Selendang Ayu* spill showed continued exposure to lingering hydrocarbons 3 years after the spill (Flint et al. 2012).

Smaller spills of petroleum and petroleum products have affected habitat quality on a small scale throughout the range of the Alaska-breeding Steller's eider, posing some risk to individuals. Exposure to oil or other contaminants near fish processing facilities in southwest Alaska was identified in the 2002 species' recovery plan as a particular concern for Steller's eiders. Most of the Pacific-wintering population of Steller's eiders winters in shallow, nearshore waters from the eastern Aleutians to southern Cook Inlet, Alaska, including in and near areas with substantial maritime traffic and/or industrial activity and other human presence. Areas where Steller's eiders have been observed roosting and feeding in harbors, bays, and other nearshore waters with substantial maritime traffic and/or industrial activity (including fish processing facilities) include Dutch Harbor, Akutan, Sand Point, King Cove, Cold Bay, and Women's Bay (Kodiak). Many of these areas are occupied by large wintering or staging flocks.

Conservative estimates indicate at least 18,000 gallons (68,137 liters) of petroleum products were spilled from activities associated with the commercial fishing and seafood processing industry from 1995 to 2000, and at least 18,170 gallons (68,781 liters) of petroleum products are spilled annually in harbors in southwest Alaska (USFWS 2017). Much of the petroleum is spilled at Dutch Harbor, near where hundreds of Steller's eiders winter. Other areas where Steller's eiders have been observed roosting and feeding in harbors, bays, and other nearshore waters with substantial maritime traffic and/or industrial activity, including fish processing facilities, include

Akutan, Sand Point, King Cove, Cold Bay, and Women's Bay. Steller's eiders sampled in southwest Alaska showed evidence of exposure to an array of organic contaminants in bays with commercial fishing and maritime activity compared to bays without (Miles et al. 2007, USFWS 2025*b*). Commercial fishing, other maritime activities, and municipal sewage effluent in areas with high coastal development could also indirectly expose Steller's eiders to contamination through contamination of prey items. For example, simultaneous to wintering Steller's eiders at Dutch Harbor showing evidence of exposure to high levels of polycyclic aromatic hydrocarbons (PAHs) or other contaminants, high concentrations of PAHs were found in blue mussels (*Mytilus trossilus*) in this area (Miles et al. 2007). Steller's eiders sampled in southwest Alaska showed evidence of exposure to an array of organic contaminants in bays with commercial fishing and maritime activity compared to bays without (Miles et al. 2007, USFWS 2025b).

Although areas with high human use in the coastal and marine environment comprise only a small portion of the habitat used by Pacific-wintering Steller's eiders, it is reasonable to expect a large number of Steller's eiders are being exposed to significant levels of petroleum and other organic contaminants when using nearshore waters in these areas (USFWS 2002*b*, Reed and Flint 2007). However, with the exception of lead, the effect of contaminants on population resiliency of the Alaska-breeding Steller's eider is unknown at this time (USFWS 2025*b*).

3.1.4.4 Harvest

Historically, Alaska Natives hunted Steller's eiders and their eggs for food; but many communities along the population's migration route had not been surveyed at the time of the 1997 ESA listing decision, and the total annual subsistence harvest at that time was unknown (62 FR 31748; June 11, 1997). Although not cited as a cause of the decline, the take of this species by subsistence hunters near Utqiaġvik was cited as a factor in the decision to list the Alaska-breeding population of Steller's eider (62 FR 31748). Harvest of Steller's eiders has also occurred on the Yukon-Kuskokwim Delta (CAFF 1997). In the mid-1990s, harvest was thought to be one of the threats limiting species recovery (CAFF 1997). All legal harvest of Steller's eiders in Alaska was closed in 1991.

Harvest regulations for waterfowl and other migratory birds in Alaska include two seasons: a spring-summer subsistence season (April 2 to August 31, with dates varying by management region; 50 CFR 92) and a fall-winter general hunting season (September 1 to January 26, with dates varying by zone; 50 CFR 20). When the spring-summer subsistence harvest of migratory birds in Alaska was opened by Alaska State regulations and Service policy in 2003, harvest of Steller's eiders remained prohibited. Harvest of Steller's eiders has apparently declined through time but does still occur despite the closure: an estimated 438 birds were harvested annually over the period 1980 to 1996 and 230 birds were harvested annually over the period 1993 to 2012 (Naves and Schamber 2024).

Outreach efforts to encourage compliance with harvest regulations that prohibit harvest of Steller's eiders have been conducted in the species' breeding range on the Arctic Coastal Plain by the Service, the North Slope Borough, and the Bureau of Land Management. Service-sponsored outreach efforts have also occurred on the Yukon-Kuskokwim Delta. Direct observations and discussions with hunters have confirmed some Steller's eiders are taken during subsistence hunting on the Arctic Coastal Plain. Steller's eiders sometimes fly in mixed flocks with king and common eiders (*Somateria spectabilis* and *S. mollissima*), are hard to identify, and are inadvertently shot on occasion. Specifically, hunters report that Steller's eiders staging in mixed flocks within waterbodies are subject to shooting. Direct observations by Service law enforcement staff and biologists in Utqiaġvik have documented Steller's eiders shot along roads and in hunters' possession (USFWS 2025*c*). Local knowledge suggests Steller's eiders have not been specifically targeted for subsistence on the Arctic Coastal Plain, but they may be subject to misidentification and inadvertent harvest. Eggs of Steller's eiders may also be incidentally collected or disturbed when harvesters are searching for goose eggs. However, limited data suggest harvest of Steller's eiders eggs has historically been low (see USFWS 2026 for further discussion on egg harvest).

A recent study of 12 years (2004 to 2015) of waterfowl harvest in rural Alaska communities derived estimates of the average annual harvest of birds and eggs by species, based on reports by rural hunters and broken down by management region and season (Naves and Schamber 2024). This study estimated an average of 202 Steller's eiders harvested annually, with 69 harvests occurring in spring-summer (i.e., April through August) and 133 harvests occurring fall-winter from 2004 to 2015 (i.e., September to March; Naves and Schamber 2024).

The spring-summer subsistence waterfowl harvest divides the state into 12 management regions (Figure 7); 8 of these regions overlap the distribution of Alaska-breeding Steller's eiders. Steller's eider harvest was reported in the each of these regions (annual estimates shown in parentheses): North Slope (n = 26), Northwest Arctic (n = 38), Bering Strait Mainland (n = 53), St. Lawrence Island-Diomede (n = 15), Yukon-Kuskokwim Coast (n = 39), Yukon-Kuskokwim Delta Inland (n = 1), Bristol Bay (n = 12), and Aleutian-Pribilof Island (n = 18). Additionally, an estimated 29 Steller's eider eggs were harvested per year on average: Bering Strait Mainland (n = 17), St. Lawrence Island-Diomede (n = 4), and Yukon-Kuskokwim Delta Coast (n = 8; Naves and Schamber 2024). Not all Steller's eiders represented in these numbers would be from the Alaska-breeding population, but birds comprising each of the two breeding populations are not distinguishable away from their breeding areas. We interpret the 26 estimated spring/summer birds on the North Slope as Alaska-breeding Steller's eiders. However, we expect annual harvest of Alaska-breeding Steller's eiders to be lower in this region due to long standing hunt closure and the low, variable population of Steller's eiders across this region. Documented harvest in Utqiaġvik, where the highest concentrations of Steller's eiders occur on the Alaskan breeding grounds, has been zero or near-zero in the most recent years compared to the 2004 to 2015 time period (USFWS 2026).

Given migration timing, we also interpret the estimated 38 harvested Steller's eiders in the Northwest Arctic management region during the fall and winter as Alaska-breeding Steller's eiders. Based on these patterns, approximately 39 of the fall–winter birds (38 (eiders estimated to be harvested in the Northwest Arctic) + 1 (0.01 × 95 = 0.95, rounded up to 1)) could represent Alaska-breeding eiders, although this is also likely an overestimate.

On a statewide scale, these harvest estimates may not be representative of contemporary harvest levels. Reliability of harvest reports is affected by sampling flaws, inaccurate recall, reluctance to report closed species, mischaracterization of fishing bycatch, failure to detect unretrieved birds, and data-collection errors (Huntington 2009, Omelak 2009, Naves 2010, USFWS 2010, George et al. 2015).

We also recognize the rate of harvest suggested by the Naves and Schamber (2024) data would be unsustainable for a population estimated to be 406 individuals. This may be because these estimates do not represent accurate contemporary harvest estimates, particularly in the North Slope region, or it may reflect an issue with the assumption of a closed population. The Alaska-breeding population of Steller's eider was listed as threatened under the ESA because of a perceived decline in abundance throughout their nesting range and geographic isolation from the Russian-breeding population. The geographic isolation meant the Alaska-breeding population was a "closed population," meaning it received no augmentation or immigration from the Russian-breeding population. However, genetic studies and modeling efforts suggest there may be dispersal from the Russian breeding population (Dunham and Grand 2017). Research was conducted to estimate population viability of the Alaskan breeding population of Steller's eiders, using both an open and closed model of population process for this threatened population (Dunham and Grand 2016). Projections under a closed population model (i.e., one with no immigration or emigration between the Alaska-breeding population and the Pacific Russia-breeding population) suggested this population has a 100 percent probability of extinction within 42 years. However, closed population models showed a poor fit with the underlying data. Open population models (i.e., with exchange between the Alaska-breeding and Pacific Russia-breeding populations) showed a better fit with the long-term aerial survey data (Dunham and Grand 2017). This suggests the Alaska-breeding population is supplemented by immigration from the Pacific Russia-breeding population and therefore dependent on viability of that source population (Dunham and Grand 2016, 2017). Because of random immigration process and nonbreeding behavior, it is likely that this population will continue to be present in low and highly variable numbers on the breeding grounds in Alaska.

We expect harvest of Steller's eiders and their eggs may continue at some level in the nesting, brood-rearing, and non-breeding areas, especially near areas of human use. Instances of inadvertent harvest or egging would likely be concentrated near communities with gravel infrastructure and more remote camps, and frequency of inadvertent harvest would decline with increasing distance from infrastructure, as human access becomes more difficult. Harvest of birds on the Arctic Coastal Plain (i.e., in the North Slope management region) is specifically identified as having a high effect on resiliency of the Alaska-breeding population (USFWS 2025*b*). Outside the Arctic Coastal Plain, the likelihood of any individual harvested would be an Alaska-breeding bird is low, given only a small percentage of Alaska-breeding birds comprise the Pacific-wintering population (USFWS 2025*b*). However, if harvest of an Alaska-breeding bird occurred in the non-breeding distribution, the population-level effect would be essentially equivalent.

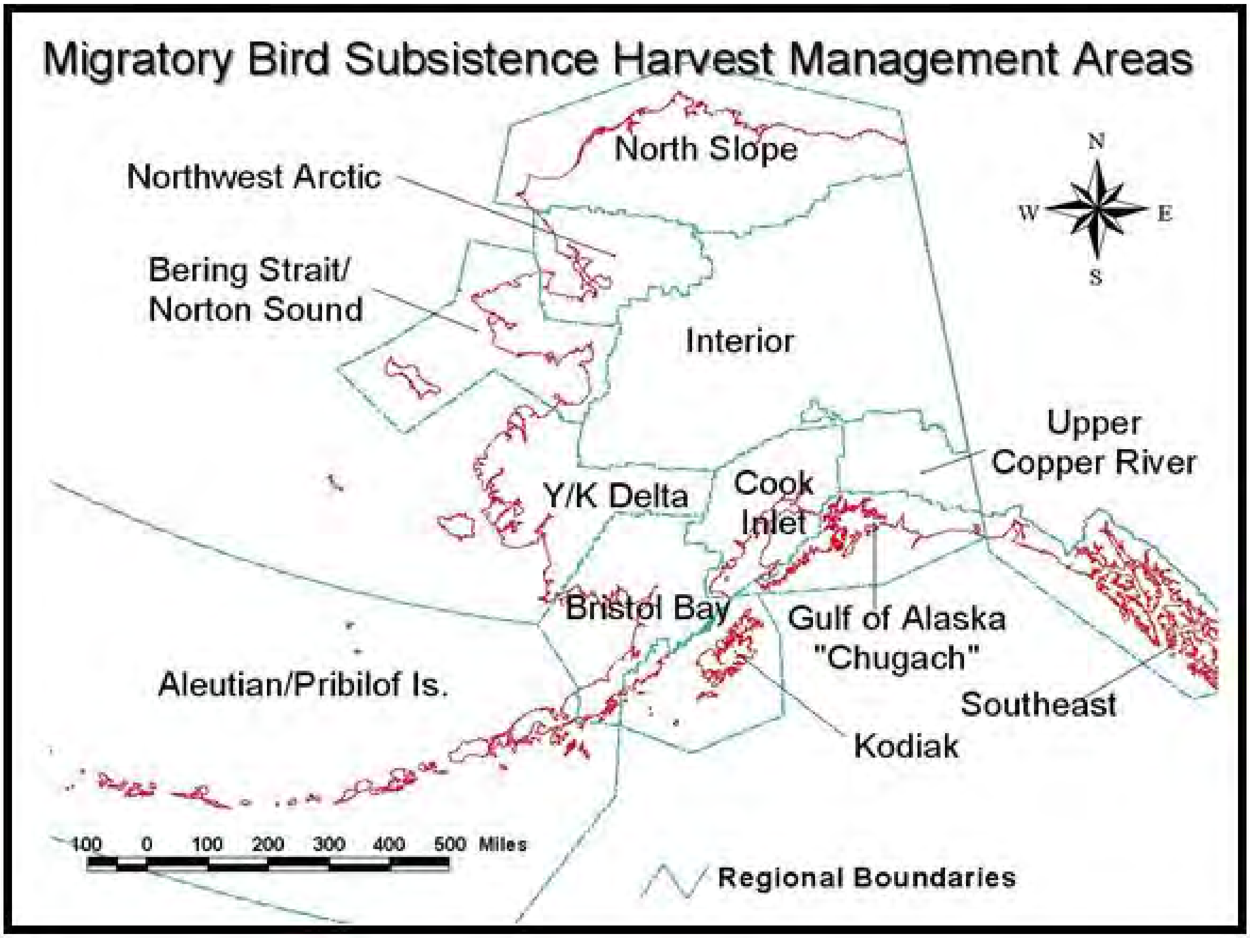


Figure 7. Regional boundaries for subsistence harvest of migratory birds. Modified from: (*https://www.fws.gov/subsistence-springsummer-bird-harvest-2024-alaska*).

3.1.4.5 Collisions

Migratory birds are at considerable risk of collisions with human-made structures and lines (Manville 2005, Grebmeier et al. 2006), including buildings, drill rigs, towers, wind turbines, light poles, and overhead transmission lines. The tendency of Steller's eiders to fly at low altitudes puts them at risk of striking even relatively low objects in their path. Eighty-eight percent of the eiders observed in one study along the Beaufort Sea coast flew below an estimated altitude of 32 ft (9.7 m), with well over half flying below 5 ft (1.5 m); eiders in this area flew at a mean height of 20 ft (6 m) above ground level and at 45 mi (72 km) per hour (Day et al. 2005). The mean flight height of eider species flying past St. Lawrence Island, Alaska in the fall has been estimated as 6 ft (1.8 m). Flock size, flight height and speed, and other variables like weather and lighting conditions affect the probability of collisions and can increase the number of eiders killed or injured during a single event. Most collisions involve one or two birds, but "bird storms" (impacting hundreds of birds at once) have been documented when vessels use bright lights during inclement nighttime weather.

Steller's eider collisions with infrastructure occur in both terrestrial and marine environments; they have been documented colliding with infrastructure that includes radio communication towers, guy wires, transmission lines, radar domes, and mobile offshore drilling units. Multiple Steller's eider power line strikes have been documented near Utqiaġvik since 1991, despite the sparseness of human structures in their nesting areas on the Arctic Coastal Plain (USFWS 2025*b*). Service records include one report from a Pilot Point resident, responsible for erecting power line (approximately 600 ft [183 m] along the shoreline) who recalled that shortly after he put the power line up, about 150 Steller's eiders flew into it and died. Mortality in Steller's eiders belonging to the Atlantic-breeding population has also been observed due to collisions with transmission lines, specifically during transit over the isthmus connecting the island of Ekkerøy to the mainland in Varangerfjord, Norway (Øien and Aarvak 2007).

Bird species, including eiders and other sea ducks, are attracted to offshore vessels and may circle or even ground on the vessels, primarily due to the effects of light attraction and disorientation (Merkel and Johansen 2011, Ronconi et al. 2015). Risk of marine bird collisions with vessels in waters of Alaska shows seasonal patterns; collision risk increases when visibility is poor and during winter when skies are dark longer (Merkel and Johansen 2011, Kapsar et al. 2025). Risk of collisions increases in areas with high co-occurrence (i.e., spatiotemporal overlap; Kapsar et al. 2025), and marine vessels transiting through the migration corridors and molting areas pose the highest risk to Steller's eiders (USFWS 2025*b*). Vessel speed influences the likelihood of striking marine wildlife (Silber et al. 2021).

Steller's eiders have a high risk of collision with vessels because of their tendency to fly low and fast over the water (Day et al. 2004); and Steller's eider mortality has occurred due to collisions with large vessels and ship rigging, with most documented events in Alaska involving large, lighted fishing vessels at night (Labunski et al. 2022). Bright lights on fishing boats, particularly during stormy or foggy conditions, are a known hazard that can cause birds to become disoriented and land on or collide with vessels (Reed et al. 1985, Manville 2005). As with land-based infrastructure, collisions with vessels can result in injury or death to Steller's eiders and potentially to large numbers at once. Over 150 Steller's eiders were reported to have collided with the *M/V* Northern Endeavor in December 1980 in False Pass, when the fishing vessel's crab lights were illuminated on a stormy night (USFWS, Southern Alaska Field Office, unpublished data).

Current vessel traffic density is notably high along the coast of the Alaska Peninsula and Aleutian Islands (Silber et al. 2021), and we assume there will be continued increases in shipping traffic through Aleutian passes between the North Pacific and Bering Sea in response to changing oceanic conditions. However, the extent of collisions with vessels is largely unknown because data are limited; coverage by dedicated species observers is uneven in Alaska and low in some management areas and some fisheries, and we expect Steller's eiders are not always noticed or reported by observers or vessel crew. The effect of vessel collisions on the Alaska-breeding Steller's eider population is therefore difficult to quantify. The risk of Steller's eider mortality through collisions is expected to increase as infrastructure and vessel traffic increases throughout their range. Overall, collisions with man-made infrastructure are thought to have a moderate effect on the resiliency of the Alaska-breeding population of Steller's eiders (USFWS 2025*b*).

3.1.4.6 Fishing Interactions

Fishing activities can lead to direct mortality through drowning if eiders are entangled in nets, as evidenced by studies involving Steller's eiders from the Atlantic-breeding population. One study in Estonia, Lithuania assessed moderate mortality to Steller's eiders through non-target (i.e., incidental) gillnet fishery bycatch (mortality estimated at 10 to 50 individuals per winter, or approximately 3 percent of the birds wintering in this region, during 2000 to 2001 (Žydelis et al. 2006). The larger-sized mesh used in salmon fishing appears to have relatively high rates of Steller's eider bycatch (Dagys and Žydelis 2002). Fishing activities can also displace eiders from preferred habitats through disturbance (Žydelis et al. 2006).

3.1.4.7 Predation

Steller's eiders in the vicinity of developed areas have likely been impacted by elevated predator populations for two primary reasons, both which support increases in predator populations (USFWS 2025*b*): 1) human presence may increase the availability of food (e.g., landfills and marine mammal carcasses), and 2) human development may increase nesting and denning sites for avian and mammalian predators. In nesting habitats, predation is a major driver of nest failure and duckling mortality among Steller's eiders, and annual variation in nest success is likely determined by fluctuations in local predator populations or broad-scale predator dynamics (USFWS 2025*b*). Incubating females may themselves be vulnerable to predators. Even in the larger true eiders, females incubating eggs may also be killed by snowy owls and Arctic and red foxes (*Vulpes lagopus* and *V. vulpes*); (Petersen et al. 2000). As the number of structures and anthropogenic attractants on the Arctic Coastal Plain continues to increase, elevated predator populations may reduce the reproductive success of Steller's eiders. Increased predation pressure is thought to currently have a moderate effect on resiliency of the Alaska-breeding population of Steller's eider and may be exacerbated by climate-related changes in predator-prey dynamics (see 3.1.4.8), through impacts to breeding effort and reproductive success (USFWS 2025*b*).

Steller's eiders are also vulnerable to predators during the non-breeding period. Bald eagles (*Haliaeetus leucocephalus*) are a common predator of adult Steller's eiders and have been observed to harass and prey upon Steller's eiders and other sea ducks in nearshore habitats, including at Dutch Harbor and at the Izembek Lagoon complex (Reed and Flint 2007, USFWS/Lance et al. 2007). Eagle predation upon Steller's eiders appears to increase at Kinzarof Lagoon during times when salmon are less accessible (e.g., due to late runs or freezing conditions in area streams (USFWS/Lance et al. 2007). Bald eagle predation on Steller's eiders may also increase during extreme winters, when waterfowl in the Izembek Complex become densely concentrated in small areas of open water with reduced feeding opportunities, leading to depleted energy reserves, poor body condition, and exhaustion. Predation in marine areas is thought to have a moderate effect on resiliency of the Alaska-breeding population of Steller's eider (USFWS 2025*b*).

3.1.4.8 Climate Change

A wide variety of climate-related changes are occurring in terrestrial habitats across the circumpolar Arctic, including tundra areas where Steller's eiders nest and raise broods. The most prominent effects of climate change on Steller's eider habitat are likely to occur within their nesting areas and could involve both the physical environment and the biota. Impacts being observed in Alaska include changing snow conditions, earlier snowmelt, reduced sea ice, glacial retreat, warmer permafrost, changing precipitation patterns, drier landscapes, increased wildfires, and more extensive insect outbreaks (Chapin et al. 2014). The ponded habitats on which Steller's eiders rely for brood-rearing are also being impacted by climate change: together with changes in precipitation and warmer air temperatures, permafrost degradation and erosion is contributing to declines in pond area and abundance; and storm surge flooding increasing salinity in freshwater ponds and increased pond temperatures could be influencing primary productivity and invertebrate communities (USFWS 2021*a*). Changes to climate and to tundra habitats are creating cascading ecosystem changes, such as changed predator-prey dynamics (Aars and Ims 2002, Kausrud et al. 2008, Gilg et al. 2009, USFWS 2021*a*) and changed weather patterns, which could expose Steller's eiders to harsher weather or increased predation pressure during the breeding season (USFWS 2021*a*). Permafrost degradation could also result in exposure to additional contaminants. Ongoing climate warming will increase risk of contamination and mobilization of toxic substances via permafrost degradation and could further limit the availability of suitable feeding and brood rearing ponds.

Although the net impacts of climate change on Steller's eiders and their terrestrial habitats are unclear, such impacts are expected to continue unabated and could have cascading effects on the reproductive success of Steller's eiders, including by limiting the availability of suitable feeding and brood rearing ponds, disrupting current predator-prey dynamics in nesting and brood-rearing areas, and causing increased energy expenditure, which could in turn increase energy requirements and/or impact reproductive effort and success. With the exception of harsh weather events, the effect of climate-related change on the resiliency of the Alaska-breeding Steller's eider cannot be measured and is considered unknown; harsh weather during the breeding season is expected to have a moderate effect on population resiliency, through reduced breeding effort and reproductive success (USFWS 2025*b*).

A wide variety of climate-related changes are also occurring in marine habitats used by Steller's eiders throughout their distribution. Long-term data suggest the North Pacific and Arctic Oceans are experiencing a warming trend. Over large areas of the seasonally ice-free Arctic, summer sea surface temperatures have increased around 0.9° F (0.5° C) per decade from 1982 to 2017 (IPCC 2019). Historically, the climate of the Bering Sea has alternated between warm and cold years but has more recently been dominated by multi-year warm periods (Stabeno et al. 2012). In the Northern Gulf of Alaska, sea surface temperatures increased 0.396° ± 0.18° F (0.22 ± 0.10° C) per decade over 1970 to 2021 (Danielson et al. 2022). Climate-induced changes in sea surface temperature may have cascading effects on the marine ecosystem, such as increasing ocean acidification negatively affecting bivalves, which may in turn lead to a decrease in availability of an important prey resource for Steller's eiders (see 3.1.4.10). This could be exacerbated by changing weather patterns in nearshore marine environments, which could expose Steller's eiders to harsher weather during the wintering and spring seasons and increase energy requirements, possibly impacting survival or physiological condition in subsequent seasons (USFWS 2021*a*).

The northern Pacific Ocean, including connected waters, is subject to long-term cycles in oceanic conditions (e.g., Pacific Decadal Oscillation, or PDO) and regime shifts defined by rapid changes in ecosystem structure, such as alterations to primary productivity, invertebrate populations, and fisheries, which then persist over a decadal time scale (Overland et al. 2008). Areas used by Steller's eiders for molting, wintering and spring staging along the eastern Bering Sea and Gulf of Alaska appear to be climate vulnerable. The net effect on Steller's eiders of past and present climate-related changes in the marine environment has not been adequately measured, but it appears there is high uncertainty of prey availability for Steller's eiders in molting, wintering, and spring staging areas over the next few decades (Smith et al. 2019).

Existing studies suggest Steller's eider survival rates may be influenced by climate variability. Model-based results by Frost et al. (2013) indicate the lowest annual survival estimates for Steller's eiders in the Pacific-wintering population during the period 1993 to 2003 coincided with a brief warming event in the PDO; and the return to cooler temperatures in the Bering Sea coincided with an increasing trend in Steller's eider survival and the highest estimated annual survival rates. However, conclusions about the effects of the PDO on Steller's eiders cannot be drawn from apparent correlation with a single climatic event (Frost et al. 2013).

3.1.4.9 Disease

Steller's eiders can be exposed to naturally occurring disease, parasites, and toxins during any part of their life cycle. Individuals are more likely to be exposed to diseases during molt and during wintering, when they concentrate in large flocks and increase their chances for bird-to-bird transmission (USFWS 2025*b*). Use of harbors where fish waste is disposed may expose them to higher rates of potentially pathogenic *Escherichia coli* and other contaminants (see 3.1.4.3). The effect of this stressor on resilience of the population of Alaska-breeding Steller's eider is unknown (USFWS 2025*b*).

Emerging threats include highly pathogenic avian influenza (HPAI) and harmful algal blooms (HABs). Since 2020, the clade 2.3.4.4b HPAI H5N1 virus (i.e., highly pathogenic avian influenza) has spread rapidly and caused unprecedented outbreaks in wild birds around the globe (Xie et al. 2025). Waterfowl act as a natural reservoir, as they frequently carry avian influenza viruses (including lower pathogenicity viruses) and often aggregate in high concentrations in wintering areas and/or on breeding grounds (CMS FAO Co-convened Scientific Task Force on Avian Influenza in Wild Birds 2023, Graziosi et al. 2024). Wild birds exposed to HPAI H5N1 have a high rate of mortality (Xie et al. 2025), and mass mortality events have been observed in several species of wild birds, including common eiders (*Somateria mollissima*). In a nesting population of common eiders on the Atlantic coast of North America, an estimated 7 to 19 percent of the breeding population may have been lost due to an HPAI H5N1 outbreak in 2022 (Avery-Gomm et al. 2024). Because it has been sustained in wild bird populations and due to its severity and near-global spread, the HPAI H5N1 virus is considered a threat to wild bird conservation (CMS FAO Co-convened Scientific Task Force on Avian Influenza in Wild Birds 2023, Graziosi et al. 2024). There are no confirmed cases of HPAI H5N1 in Steller's eiders to-date.

Documented exposure pathways of marine birds to HABs are primarily through food web transfer. In Alaska, the two primary HAB toxins of concern are saxitoxin (a neurotoxin produced by certain species of *Alexandrium* dinoflagellates, which cause "paralytic shellfish poisoning") and domoic acid (a neurotoxin produced by the diatom *Pseudo-nitzschia*, which can cause seizures and other neurologic distress). Shellfish are a well-known source of dietary exposure to HAB toxins (Anderson et al. 2022); and in Alaska high concentrations of paralytic shellfish toxins have been documented in prey items favored by eiders, including in areas with mortality events in other marine top predators (Chambers and Magnuson 1950, Lefebvre et al. 2016, Van Hemert et al. 2022). Marine birds in Alaskan waters are commonly exposed to levels of saxitoxin and domoic acid that have been shown in laboratory trials to be harmful to mallards (*Anas platyrhynchos*; (Alaska Science Center 2026). However, species-specific sensitivity to these toxins is generally unknown (Anderson et al. 2022). Exposure to HABs can lead to mortality (Shumway et al. 2003, Starr et al. 2017, Van Hemert et al. 2022), and has been documented in sea ducks such as white-winged scoters (*Melanitta deglandi*) in California and common eiders in the North Atlantic (Shumway et al. 2003, Starr et al. 2017, Gibble et al. 2021). Sublethal effects in marine birds include reduced feeding activity, decreased reproductive potential, loss of motor coordination, and neurological deficits (Shumway et al. 2003). Changing ocean conditions (e.g., increased temperatures and decreased sea ice prevalence) may also lead to conditions that more frequently promote HABs formations, which would increase exposure risk (Anderson et al. 2022).

3.1.4.10 Changing Prey Availability

Benthic ecosystems are vulnerable to environmental variation, and warming conditions may lead to shifts in benthic flora and fauna (Schiel et al. 2004, Grebmeier et al. 2006, Liu et al. 2019). Climate-related changes to ocean conditions could therefore lead to further changes in availability and quality of benthic prey for Steller's eiders (see 3.1.4.8 and 3.2). A recent study comparing the availability of benthic prey at Izembek Lagoon for molting Steller's eiders found significantly less bivalve and crustacean biomass, and smaller-sized bivalves and gastropods, in 2019 compared to 1998 (Maliguine et al. 2025). Because Steller's eiders increase their bivalve diet during molt (Petersen 1981, Troy and Johnson 1989, Metzner 1993) and may select for larger bivalves during this period (Petersen 1980), prey availability at Izembek Lagoon may not be as optimal for molting eiders as it has been in the past (Maliguine et al. 2025). Changes in prey availability could result in lowered body condition or survival for molting eiders and/or could result in a redistribution of eiders to molting areas with higher benthic biomass (Maliguine 2024) if suitable alternatives are available.

3.1.5 Recovery Criteria for Alaska-Breeding Steller's Eiders

The Steller's Eider Revised Recovery Plan (USFWS 2021*a*) presents research, monitoring, and management actions; such actions are re-evaluated and adjusted periodically, with the objective of population recovery so that protection under the ESA is no longer required.

When the Alaska-breeding population was listed as threatened, factors causing the decline were unknown; possible causes were identified as ingestion of lead shot present in wetland habitats and unknown changes in molting and wintering habitats in the Bering Sea. Other potential threats have been identified since listing, including in the original recovery plan (USFWS 2002*b*), including increased predation pressure, overharvest, exposure to other contaminants, risk of collision with structures and vessels, disturbance caused during human activities near the core nesting area, and loss or alteration of nesting habitats through human development. Other potential stressors have since been identified (see 3.1.4), but the causes of decline in Alaska-breeding Steller's eiders and obstacles to recovery of this population remain poorly understood.

Criteria used to determine when species are recovered are often based on historical abundance and distribution, or on the population size required to ensure that extinction risk, based on population modeling, is tolerably low. For Steller's eiders, robust information on historical abundance is lacking, and demographic parameters needed for accurate population modeling are poorly understood.

The revised 2021 Steller's eider recovery plan (USFWS 2021*a*) established recovery criteria based heavily on the viability of the species, recognizing the relationship between the Pacific Russia- and Alaska-breeding populations and the importance of the larger Pacific-wintering population. The 2021 plan offers two alternative demographic criteria, based on available information on trend of the Pacific-wintering population. In the 2021 plan, recovery criteria for the Alaska-breeding population are not wholly dependent on status of the larger Pacific-wintering population. The general concepts used to develop specific demographic metrics and thresholds for recovery criteria included:

- Over a long timeframe, the abundance of Steller's eiders in Alaska should be maintained or increase compared to that observed over the past 30 years;
- Steller's eiders should be distributed in the Utqiaġvik Ground survey area, and broadly across the Utqiaġvik Triangle and the Arctic Coastal Plain survey areas, or they should be present over a similarly wide distribution that includes areas of Alaska where they do not currently nest; and
- If the population trend of the Pacific-wintering population is unknown or is decreasing, the number of breeding Steller's eiders in Alaska, and our confidence in that number, should be higher.

The specific criteria developed from these concepts are:

1. We must be 80 percent confident the Pacific-wintering population has an abundance trend of ≥ 1.0, using at least five years of data but not exceeding a time interval of 15 years; and
2. We must be 80 percent confident that individual Steller's eiders present in the Utqiaġvik ground survey area number 50 birds or greater, individuals in the Utqiaġvik Triangle number 200 birds or greater, and individuals present across the Arctic Coastal Plain survey (excluding these two areas near Utqiaġvik) number 100 birds or greater over a 20-year timeframe; or there are greater than 350 individuals in Alaska across a wide distribution;

Or, if the Pacific-wintering population trend is unknown or declining,

3. We must be 95 percent confident that individual Steller's eiders present in the Utqiaġvik ground survey area number 75 birds or greater, individuals in the Utqiaġvik Triangle number 300 birds or greater, and individuals present across the Arctic Coastal Plain survey (excluding these two areas near Utqiaġvik) number 150 birds or greater over a 20-year timeframe.

Additionally, the recovery plan includes threats-based criteria that should be met. Threats include but not limited to ingestion of lead ammunition, mortality from shooting, bird collisions with structures, human disturbance in the breeding area, nest predation, and changes to the ecological community. Threats must be found to not affect the ability of the population to meet and maintain the demographic criteria included in the plan.

In the most recent 5-year status review (USFWS 2025*d*), the Service determined that the Alaska-breeding population of Steller's eiders continues to meet the definition of threatened, as the population has not met the demographic- and threats-based recovery criteria for delisting, as laid out in the 2021 recovery plan (USFWS 2021*a*). The population has low resiliency, as low numbers of Steller's eiders are annually present in Alaska and have highly variable vital rates, and low redundancy, as only one extant subpopulation remains with a wide but sparse distribution outside of Utqiaġvik. While the population has moderate representation – as indicated by the varied diet and habitat use of Steller's eiders, adequate genetic diversity, and wide non-breeding distribution – the population remains vulnerable to environmental stochasticity and catastrophic events. Additionally, the identified stressors to the population are likely to worsen over time in the breeding and non-breeding habitats (USFWS 2025*d*).

3.2 Critical Habitat for Steller's Eider

In 2001, the Service designated critical habitat for the Alaska-breeding population of Steller's eiders (50 CFR Part 17). The total area of designated critical habitat is 2,830 square miles (mi^2)(7,330 square kilometers [km^2]) across five units, including: the Yukon-Kuskokwim Delta (Unit 1) for nesting; Kuskokwim Shoals (Unit 2) and Seal Islands (Unit 3) for molting and staging; and Nelson Lagoon (Unit 4) and Izembek Lagoon (Unit 5) for molting, wintering, and staging (Figure 8). The Izembek Lagoon critical habitat unit includes all waters of Izembek Lagoon, Moffett Lagoon, Applegate Cove, and Norma Bay, and waters 0.25 mi (400 m) offshore of the Kudiakof Islands (which close the entrance to Izembek Lagoon) and adjacent mainland.

The physical or biological features essential to conservation of the species, and which may require special management considerations, were identified as Primary Constituent Elements (PCEs). For the Yukon-Kuskokwim Delta (Unit 1), the PCE includes the vegetated intertidal zone and all open water inclusions within this zone. For Units 2 through 5, the PCEs include marine waters up to 30 ft (9 m) deep and the underlying substrate, the associated invertebrate fauna in the water column, the underlying marine benthic community, and where present, eelgrass beds and associated flora and fauna.

Units selected for designation as critical habitat areas are those where Steller's eiders consistently occur at relatively high densities, where Steller's eiders are especially vulnerable to disturbance and contamination due to flightlessness, and/or they are areas essential to species' survival and recovery given the best available data.

The physical habitat of Steller's eiders is largely unaltered from natural conditions throughout most of the species' distribution in Alaska. Human populations in most of the designated critical habitat areas are small, and development has been limited to few, widely dispersed communities and industrial centers. Developments that have physically modified small areas of Steller's eider habitat consist of infrastructure such as roads, gravel pads, docks, piers, and boat harbors, which are limited to nearshore waters immediately adjacent to communities and industrial centers. Some Steller's eiders continue to use these areas. However, management actions identified as important to species recovery include: 1) protecting breeding habitat on the Arctic Coastal Plain, particularly in areas with the highest observed nesting density; and 2) protecting habitat in marine areas, specifically in important molting, wintering, and staging areas (USFWS 2021*a*). The recovery plan also identified research aimed at predicting habitat change in the non-breeding areas and the subsequent impact of predicted change to population viability as important for management of Steller's eiders (USFWS 2021*a*).

Natural regime shifts in the northern Pacific Ocean are defined by rapid but persistent changes in ecosystem structure, including alterations to primary productivity and invertebrate populations (Overland et al. 2008). Areas used by Steller's eiders for molting, wintering and spring staging along the eastern Bering Sea and Gulf of Alaska appear to be climate vulnerable. Predicted changes in molting and spring staging areas along the eastern Bering Sea and Gulf of Alaska include increasing temperatures in areas of shallow sea water and decreased sea ice concentration (Smith et al. 2019). There is high uncertainty regarding how these projected changes may impact prey availability for Steller's eiders in their critical molting, wintering, and spring staging habitat over the next few decades: three climate models assessing the same spatial data related to environmental and forage conditions projected inconsistent effects to the biomass of benthic infauna (e.g., bivalves, amphipods, and polychaetes; marine invertebrate species used by Steller's eiders). Along the northern Alaska Peninsula, the three-model average projected a decrease in biomass of benthic invertebrates in some areas, including Izembek Lagoon, and a slight increase in other areas (Smith et al. 2019).

Prey abundance and quality are important components of the PCEs for critical habitat Units 2 through 5. Although benthic systems are vulnerable to regime shifts and other variability in marine environments (Grebmeier et al. 2006, Liu et al. 2019), the Smith et al. assessment showed some uncertainty in how projected changes in Steller's eider molting, wintering, and spring staging areas could affect prey availability for Steller's eiders, including in critical habitat areas, over the next few decades (Smith et al. 2019, USFWS 2025*b*). Climate-related changes can also affect the health of eelgrass, which are an important foundation species in many shallow water environments (see sections 1.3.4 and 5.1.3.1) and lead to reduction in spatial extent, density of eelgrass blades, and other impacts to eelgrass.

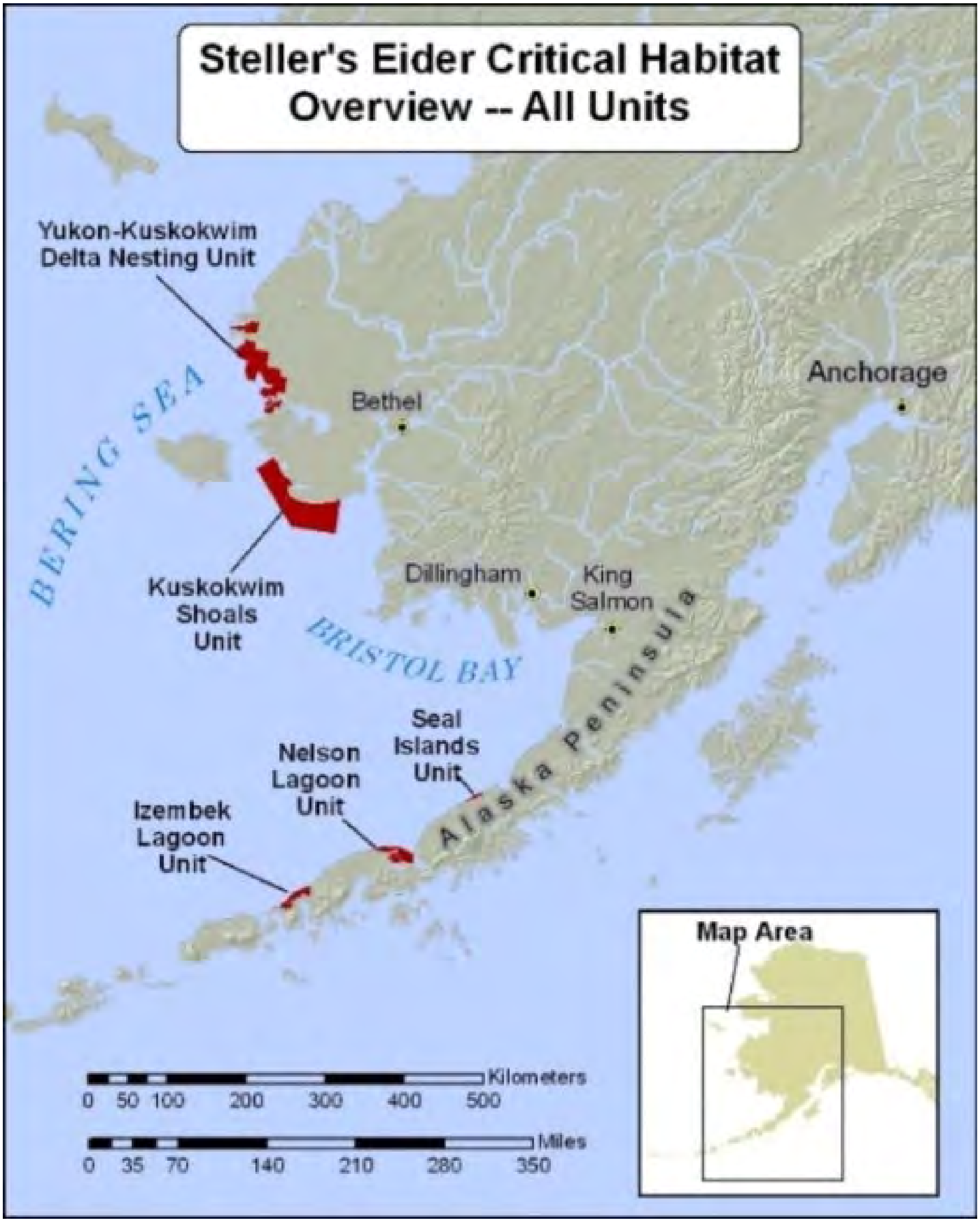


Figure 8. Map of designated critical habitat for Steller's eider.

3.3 Status of the Northern Sea Otter

The northern sea otter is a marine mammal that lives in shallow marine areas along the shores of the North Pacific. Adults reach 51 inches (130 centimeters) in length and 66 pounds (30 kilograms) in weight (Kenyon 1969). They depend on fur instead of blubber for insulation (Riedman and Estes 1990). Sea otter fur consists of a sparse outer layer of guard hairs with very dense underfur (Kenyon 1969). They have a long history of being commercially harvested for their fur.

The Service recognizes three “stocks” of northern sea otters in Alaska: Southeast Alaska, Southcentral Alaska, and Southwest Alaska (USFWS 2013; Figure 9). The term “stock” is used by the Service and the National Marine Fisheries Service in the context of managing marine mammal species under the MMPA. The southwest Alaska DPS, listed as threatened under the ESA, is the same entity as the southwest Alaska stock.

3.3.1 Listing Status

The Service listed the southwest Alaska DPS of the northern sea otter as threatened on August 9, 2005 (70 FR 46366). Sea otters forage in nearshore marine and intertidal habitat, usually remaining within a couple of mi of their established feeding grounds, where bottom depths are typically less than 300 ft (91.4 m; USFWS 2013). Critical habitat was designated in 2009 (74 FR 51988; October 8, 2009).

At the time of the 2005 final listing rule for the species, the Service estimated the southwest DPS had experienced a rapid decline in abundance of more than 50 percent since the late 1980s and consisted of approximately 42,000 sea otters. The cause of the decline was not certain, but the weight of evidence pointed to increased predation, probably by the killer whale (*Orcinus orca*; USFWS 2013).

3.3.2 Life History

maturation may be delayed to four or five years of age when food resources are limited (von Biela et al. 2009). Sea otters mate throughout the year, and gestation requires about six months. Although young may be born in any season, most pups are born in late spring in Alaska. Like other marine mammals, they have only one pup during each breeding cycle. The female’s maternal instinct is strong, and she seldom leaves her pup except when diving for food. When the female travels or sleeps, the pup usually rides on its mother’s chest as she floats on her back. The pup may weigh 31 pounds (14 kilograms) or more when weaned. Females can produce one pup a year but may produce pups less frequently in areas where food is limited. Many sea otters live for 15 to 20 years. They usually do not migrate and seldom travel far unless an area has become overpopulated and food is scarce. The home range of individual sea otters can vary from only a few mi^2 to over 15 mi^2 (40 km^2; Schneider and Ballachey 2008).

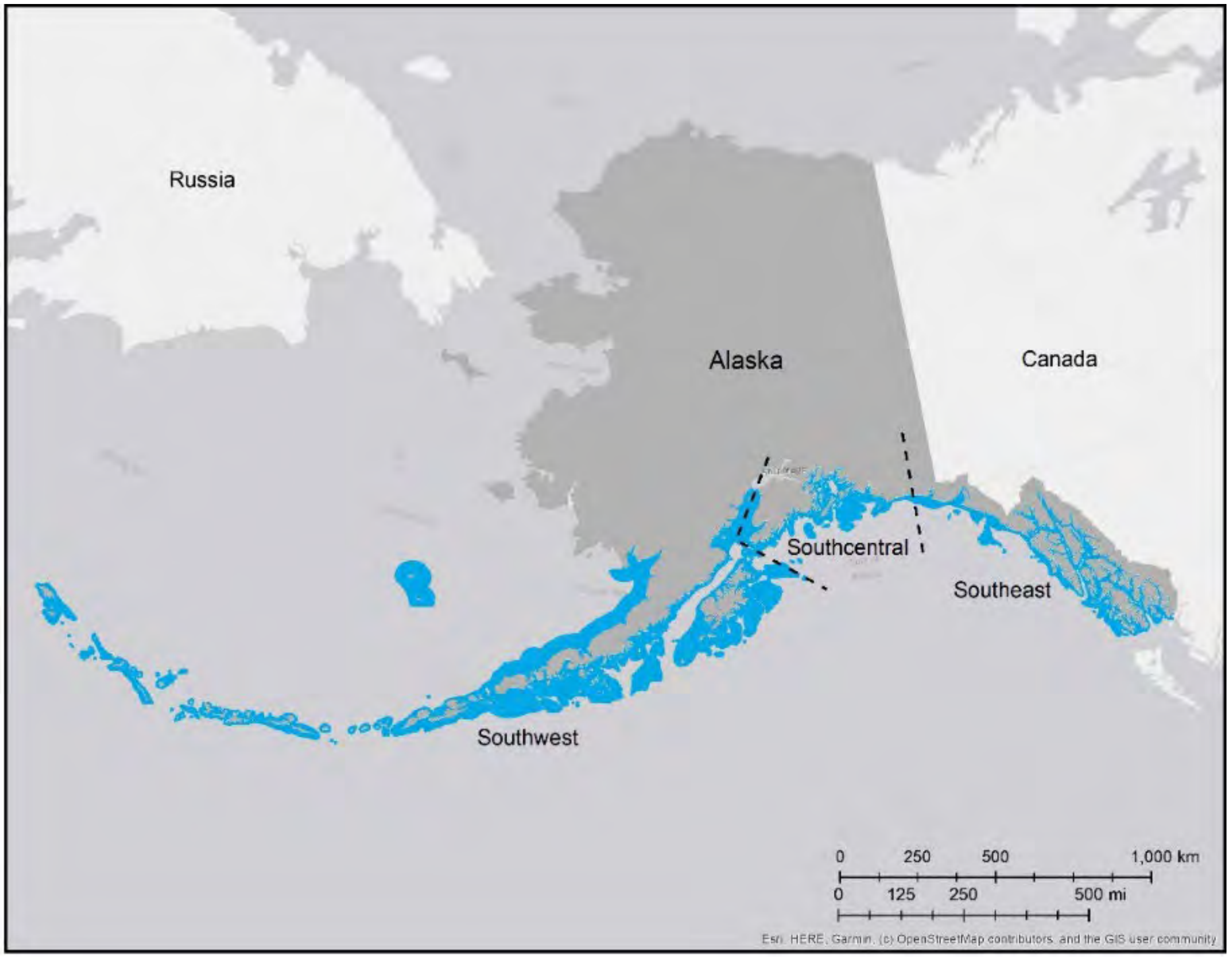


Figure 9. Northern sea otter distribution in Alaska, in blue (USFWS 2023*a*). Sea otter populations or "stocks" are delineated by dashed lines. The southwest population is listed as threatened under the ESA.

3.3.3 Diet and Habitat Use

Sea otters forage in nearshore coastal areas with rocky and soft-sediment substrates, typically close to shore in waters less than 131 ft (40 m) depth (Estes 1980, VanBlaricom and Estes 1988). They dive to gather food (sea urchins, crabs, clams, mussels, octopuses, other marine invertebrates) from the seafloor in relatively shallow water (Riedman and Estes 1990). Distribution is largely limited by their ability to dive to the sea floor (Bodkin et al. 2004). Diving depth of sea otters is highly variable and ranges from 6 to 246 ft (2 to 75 m) depending on the prey species pursued (Schneider and Ballachey 2008). In the wild, sea otters never eat on land. Feeding dives generally last about 60 to 90 seconds, although some otters have been observed staying underwater in excess of five minutes (Riedman and Estes 1990). They usually dive and return with several items of food, roll on their backs, place the food on their chests and eat food piece by piece using their forepaws, sometimes using a rock to crack shells.

Otters generally spend less time foraging during summer (females 8.8 hours per day, males 7.9 hours per day) than other seasons (females 10.1 to 10.5 hours per day, males 9.2 to 9.5 hours per day; Esslinger et al. 2014). Both sexes show strong preferences for diurnal foraging and adjusted their foraging effort in response to the amount of available daylight, except for female otters after they have given birth. For approximately three weeks post-partum, females switch to nocturnal foraging, possibly to reduce the risk of predation by eagles on newborn pups (Esslinger et al. 2014).

The southwest Alaska DPS primarily prey on hard-shelled invertebrates, including sea urchins (e.g., *Strongylocentrotus droebachiensis*), abalone and other marine snails (e.g., *Haliotis kamtschatkana*), crabs (e.g., *Telmessus spp*.), mussels (*Mytilus spp.)*, and clams (e.g., *Saxidomus spp*.) (USFWS 2023*a*). Kelp forests provide food and habitat for many prey species.

Northern sea otters use areas of kelp forests, seagrass beds, and barrens, with habitat use often a function of prey abundance, foraging energetics, and predation pressure (Kenyon 1969, Monson et al. 2000). In addition to providing a source of prey, kelp canopy is important resting habitat on the outer coast. Kelp reduces tidal energy and provides a means of anchoring for sea otters, removing the need for repeated repositioning when sea otters are resting. It also serves as nursery habitat for adult females and their pups (Riedman and Estes 1990) and provides protection from some marine predators (Nicholson et al. 2018). Although kelp canopy is important, sea otters are known to use some areas that lack kelp.

Kelp communities are sensitive to sewage, industrial waste discharges, sedimentation and other causes of poor water and sediment quality (Coelho et al. 2000, Contreras-Porcia et al. 2023). Pollution contributes to kelp forest degradation. For example, high sedimentation from coastal run-off may bury new plant shoots. Kelp may experience reduced growth rates and reproductive success in more toxic waters and sediments. Other threats to kelp include climate change and overgrazing by fish or sea urchins.

3.3.4 Distribution

The range of the southwest Alaska DPS (Figure 10) includes the west side of Cook Inlet, the Alaska Peninsula and Bristol Bay coasts, and the Aleutian, Barren, Kodiak, and Pribilof Islands. The northern sea otter recovery plan identifies five Management Units (MUs, Figure 10) within the ESA-listed DPS: 1) Western Aleutian Islands; 2) Eastern Aleutian Islands; 3) South Alaska Peninsula; 4) Bristol Bay; and 5) Kodiak, Kamishak, Alaska Peninsula (USFWS 2013).

3.3.5 Populations and Trends

Population size estimates are periodically released in stock assessment reports. The Service's 2023 Sea Otter Stock Assessment Report provides the most current population estimates (USFWS 2023*a*). The report estimates a population size of the southwest stock at approximately 51,935 sea otters, which is slightly less than the estimated 55,000 in 2014 (USFWS 2023*a*). Population estimates are also provided for each management unit (MU; Table 1).

The status of the southwest Alaska DPS was evaluated and summarized in the Species Status Assessment (SSA), including an assessment of species viability. The SSA defines viability as the ability of the species to sustain populations over time (USFWS 2020). Indicators of viability include resiliency, redundancy, and representation. Populations with high levels of these indicators would be expected to maintain viability over a 30-year period, while low levels signify potential population declines. The SSA summarized current viability conditions by MU (USFWS 2020, Table 2).

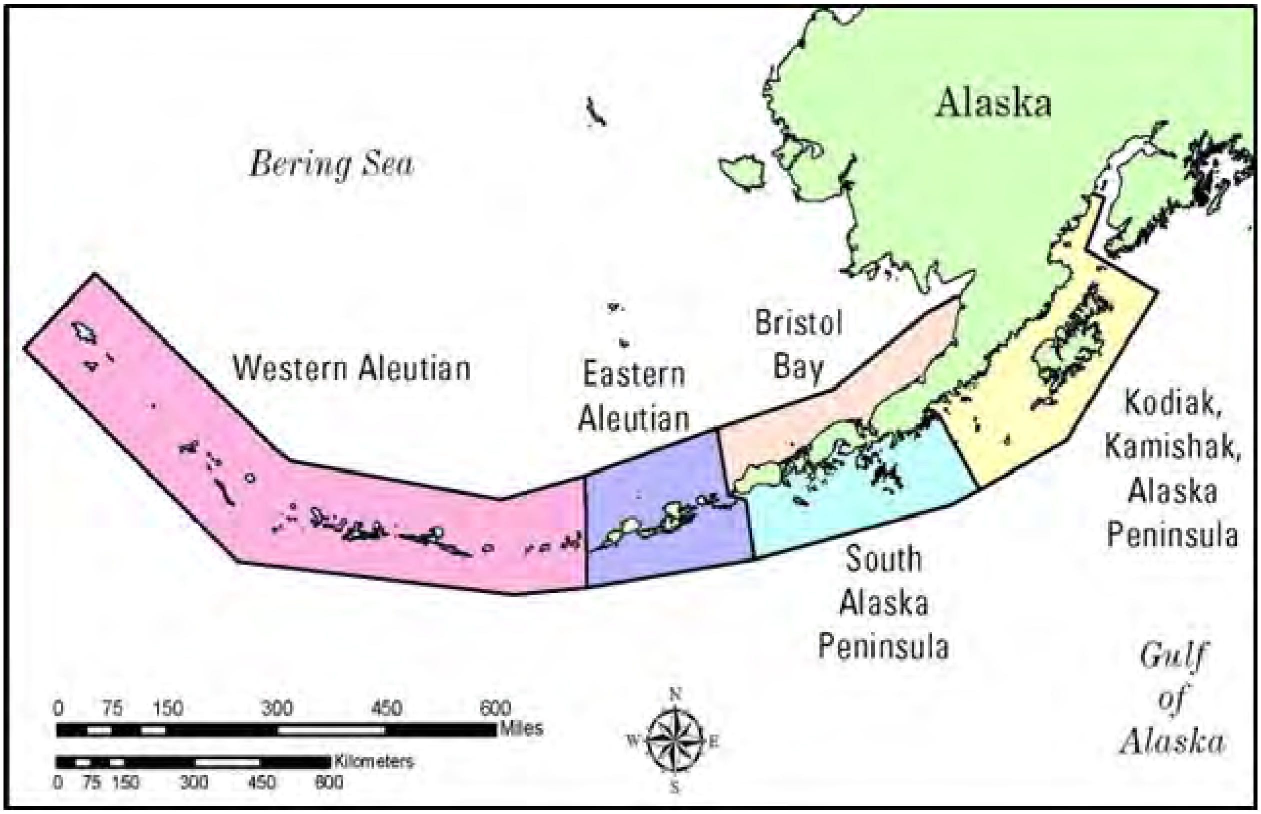


Figure 10. Southwest Alaska DPS of sea otters with management units.

3.3.6 *Threats*

Two primary threats have caused historical population declines among Alaska's sea otters. The first was overharvest during commercial hunting. The commercial sea otter fur trade peaked in the late 1800s, then waned with the decrease in availability of sea otters. Overharvest is not currently considered a threat. The second major threat is predation, probably by killer whales (*Orcinus orca*). Killer whales are generally assumed to have caused declines in the southwest Alaska DPS in the 1980s and 1990s and may still threaten sea otters in parts of their range.

3.3.6.1 Predation

Sea otters are preyed on by bald eagles (*Haliaeetus leucocephalus*), white sharks (*Carcharodon carcharias*), brown bears (*Ursus arctos)*, coyotes (*Canis latrans*), and killer whales (*Orcinus orca*). Predation by killer whales is hypothesized to be the primary driver of the recent decline of the northern sea otter population, and it may pose a serious threat to timely recovery of sea otter populations (USFWS 2013). Transient killer whales are thought to have shifted to diets containing more sea otters following declining availability of harbor seals (*Phoca vitulina*) and

Steller sea lions (*Eumetopias jubata*) during the mid- to late-20th century (Estes et al. 2009). Tinker et al. (2021) conducted a quantitative, probabilistic analysis of the degree of consistency between the available data and each of seven competing hypotheses explaining the cause of population decline and found the predation hypothesis had more than two times the support of any other hypothesis.

Table 1. Population estimates for the southwest Alaska DPS (USFWS 2023*a*).

Survey Area	Year	Population Estimate	CV	N_{MIN}	Reference
Kodiak, Kamishak, Alaska Peninsula	2014–2018	30,658	0.18	26,378	Cobb 2018, Esslinger 2020, Garlich-Miller et al. 2018, USFWS 2020
Bristol Bay	2016	9,733	1.07	4,665	Beatty et al. 2021
South Alaska Peninsula	2016	546	0.33	417	Beatty et al. 2021
Eastern Aleutians	2017	8,593	0.07	8,102	Wilson et al. 2021
Western Aleutians	2021	2,405	0.16	2,104	Tinker et al. 2023
Southwest DPS Total		**51,935**	*****	**41,666**	

*A global coefficient of variation (CV) is unavailable for the southwest stock due to the different survey methods and analytical approaches used for population assessments in each of the five Management Units.
CV = coefficient of variation
N_{MIN} = minimum population estimate

Table 2. Current viability of each northern sea otter MU.

Management Unit	Current Viability Condition
Kodiak, Kamishak, Alaska Peninsula	Moderate
Bristol Bay	Moderate
South Alaska Peninsula	Low
Eastern Aleutians	High
Western Aleutians	Low

3.3.6.2 Human-caused Mortality

Commercial harvest of northern sea otters began in the western Aleutians and peaked in the 1800s, causing significant population declines across Alaska and Canada (Bodkin 2015). This harvest declined as sea otters became rare, leaving behind small remnant populations in isolated locations (Kenyon 1969, Bodkin 2015). Harvest of sea otters is currently prohibited except by

Native hunters who take sea otters for subsistence purposes. The reported harvest of sea otters in Alaska is greatest around coastal villages and can change greatly from year to year.

Annual human-caused mortality was analyzed for the southwest DPS over a four-year period 2017 through 2021, with an estimated average of 177 sea otters taken per year. This estimate is well below estimated maximum number of sea otters, not including natural mortalities, that may be removed from the stock while still allowing that stock to reach or maintain its optimum sustainable population. Data for subsistence harvest of sea otters in the southwest DPS are collected by a mandatory Marking, Tagging, and Reporting Program (MTRP) administered by the Service since 1988. Total annual subsistence harvest removals averaged 176 sea otters per year over this same 5-year period, which represents less than 1 percent of the minimum population estimate (41,666 sea otters). The subsistence harvest reporting is considered a minimum estimate, as it does not account for underreporting of harvest. The MTRP indicates they have received some anecdotal reports of illegal and unreported harvest, yet the extent to which it occurs across the DPS is unknown.

3.3.6.3 Habitat Loss

Commercial activity and construction of coastal facilities including docks, piers, boat harbors, and oil and gas facilities contribute to loss of habitat. Development areas occur near towns such as Unalaska in the Aleutian Islands and Kodiak, Alaska. Concerns associated with construction activities include increased noise and behavioral responses such as avoidance. Construction activities may generate in-water and airborne noise levels that can compromise sea otter hearing or temporarily or permanently displace sea otters from important areas. Most of the Alaskan coastlines in the range of the southwest Alaska DPS is undeveloped, and habitat loss is not considered a major threat to the northern sea otter (USFWS 2013); but development in busy commercial and industrial could limit movements between local population segments.

3.3.6.4 Oil Spills and Other Contaminants

Sea otters are vulnerable to oil contamination because they rely on their fur instead of blubber for thermoregulation (Bodkin et al. 2002). Contact with oil prevents the fur from properly insulating their bodies and leads to hypothermia (Siniff et al. 1982). Oil toxicity can also be harmful to sea otters and has been documented to cause brain lesions, disorientation, liver damage, kidney failure, and damage to eyes and lungs (Peterson et al. 2003). Long-term population impacts can come from oil contamination of food resources (Dean et al. 2002, Bodkin et al. 2012). Suspension-feeding clams and mussels concentrate hydrocarbons in tissues later consumed by otters (Jewett et al. 1999).

The overall extent of impacts to the southwest Alaska DPS depends on the size and location of a spill. While large spills happen infrequently, small-scale spills (such as vessel spills) are more common. Although it is a rare event, a large-scale spill of crude oils, fuels, or other contaminants can have a significant and negative, population-level impact. For example, in 1989 a large tanker grounded in northern Prince William Sound and released 260,000 barrels of crude oil contaminating at least 1,236 mi (1,990 km) of shoreline. This incident is known as the *Exxon Valdez* Oil Spill (EVOS). When the EVOS occurred, several thousand otters were killed despite rehabilitation efforts (Ballachey et al. 1994). Another spill incident occurred in December of 2004 when a 738 ft (225 m) freighter, the *Selendang Ayu*, ran aground and broke apart near Unalaska Island in the Eastern Aleutians. The rupture resulted in the release of about 351,346 gallons (1,330 metric tons) of oil and diesel. At least two sea otters were killed due to oiling from this event, but the extent to which it affected the southwest Alaska DPS of northern sea otter, and their prey, is unknown.

Sea otters are also affected by chronic exposure to environmental contaminants such as persistent organic pollutants (POPs, which include polychlorinated biphenyls [PCBs]) and other chemicals of ecological or environmental concern. Strong location effects were seen in apparently healthy sea otters that were sampled for POPs and other chemicals from six locations in Alaska and three locations in California (Jessup et al. 2010). High levels of PCB were detected in blood serum of sea otters at two locations in Alaska (Adak and Amchitka Islands) where past military activities have been associated with continued, elevated levels of PCBs (Jessup et al. 2010). Effects of contaminant burdens include high adult mortality and impacts to growth and immune function (Jessup et al. 2010). However, this study was unable to characterize the effects that the contaminant burdens measured may have had on individual otters.

3.3.6.5 Disease

Sea otters are susceptible to multiple disease agents, including parasites, bacterial and viral infection, and biotoxins. *Helminth* parasites including tapeworm (*Cestoda*), flukes (*Trematoda*), *Nematoda*, and *Acanthacephala* species are prevalent among sea otters, including among the southwest Alaska DPS (USFWS 2020). Disease agents may have minor effects on the overall population if outbreaks are isolated and short-lived. Alternatively, pathogens and biotoxins can cause major declines by increasing morbidity and mortality or by reducing fertility or fecundity among a population segment. The Service evaluated prevalence and severity of infectious disease among the southwest Alaska DPS in the recovery plan (USFWS 2013).

Emerging threats include highly pathogenic avian influenza (HPAI) and harmful algal blooms (HABs). Marine mammals are vulnerable to the current HPAI H5N1 global epizootic event (clade 2.3.4.4b), with the first detections in North American marine mammals in 2021 (Marine Mammal Commission 2024). Although Type A influenza viruses like the current HPAI H5N1 have been detected in marine mammals since 1975 (mostly in harbor seals [*Phoca vitulina*]), the large disease outbreaks caused by the current H5N1 have not previously been observed from influenza viruses in marine mammals (Marine Mammal Commission 2024). The first confirmed case of HPAI H5N1 in North American sea otters occurred in March 2026, in a southern sea otter (*Enhydra lutris nereis*) found dead in San Mateo County, California, following an outbreak in northern elephant seals (*Mirounga angustirostris*) in this location (UC Davis Veterinary Medicine 2026).

Marine mammals are impacted by HABs through direct exposure to toxins (e.g., inhalation of aerosolized particles) or indirect exposure through food web transfer (Lefebvre et al. 2016, U.S. National Office for Harmful Algal Blooms 2019). In Alaska, the two major HAB toxins that impact marine mammals are domoic acid (a neurotoxin produced by the diatom *Pseudo-nitzschia*, commonly known as a “red tide” event) and saxitoxin (a neurotoxin produced by certain species of *Alexandrium* dinoflagellates, which cause “paralytic shellfish poisoning”). The first confirmed case of domoic acid toxicosis in marine mammals occurred in 1998 in California sea lions (*Zalophus californianus*; (Scholin et al. 2000). Domoic acid toxicosis is now considered frequent and widespread and to have severe impacts to marine mammals (U.S. National Office for Harmful Algal Blooms 2019). In marine mammals, HABs can cause mortality or sublethal effects including reduced survival, decreased reproductive potential, and neurological deficits (U.S. National Office for Harmful Algal Blooms 2019). Saxitoxin has also been linked to marine mammal deaths, including in Alaska, with the strongest evidence of saxitoxin toxicosis from a recent (2024) die-off of northern fur seals (*Callorhinus ursinus*) in the southeast Bering Sea. Exposure to both domoic acid and saxitoxin have been documented in northern sea otters (Lefebvre et al. 2016). In southern sea otters, domoic acid exposure raises the risk of fatal cardiomyopathy (Moriarty et al. 2021). Sea otters may show some ability to detect and avoid saxitoxin, but they are not immune to saxitoxin and may experience acute toxicosis and saxitoxin-related mortality (Lefebvre et al. 2016).

3.3.6.6 Climate Change

Although climate change is a global phenomenon, high latitude regions, including Alaska and the surrounding oceans, are thought to be especially sensitive to its effects (Smol et al. 2005, Schindler and Smol 2006). Data collected during the past 60 years indicate the State of Alaska has warmed more than twice as fast as the rest of the U.S., with average annual air temperature increasing by 3.1° F (1.7° C; Stewart et al. 2013). The waters within the range of the southwest Alaska DPS of northern sea otter have warmed over the last several decades and are expected to continue to warm. In the Northern Gulf of Alaska, sea surface temperatures increased 0.396° ± 0.18° F (0.22 ± 0.10° C) per decade over 1970 to 2021 (Danielson et al. 2022). Projected sea surface temperature models for the Gulf of Alaska indicate a mean temperature increase of 3.1° F (1.7° C) by 2050 and 5.9° F (3.3° C) by 2080 (Dorn et al. 2017). Eighty percent of these models predicted a range of values between 2.5° F (1.4° C) and 7.0° F (3.9° C) for both time periods. The resulting temperatures appear to be within the thermal tolerances of otters and may be advantageous in terms of maintaining thermal neutrality, and the warmer trend may allow for otters to expand their range farther north due to lack of sea ice. However, increasing sea surface temperatures may result in distribution shifts, changes in recruitment dynamics, and changes in abundance of various members of benthic communities, including some prey species and other predators to those prey.

Climate change is expected to increase disease prevalence among animal populations in arctic and subarctic regions through changes in spatial distribution among hosts, pathogens, and vector populations (Dudley et al. 2015). Overall, threats to the southwest Alaska DPS from exposure to disease agents are expected to increase due to climate change. However, it is uncertain what effect the increase in disease and parasites may have on the southwest Alaska DPS of northern sea otters in the future (USFWS 2020). Changing ocean conditions (e.g., increased temperatures and decreased sea ice prevalence) may also lead to conditions that more frequently promote HAB formations, which increases exposure risk to marine mammals (Lefebvre et al. 2016).

3.3.7 Recovery Criteria

The goal of the sea otter recovery plan (USFWS 2013) is to establish a framework of recovery actions that will ensure the long-term survival of the southwest Alaska DPS and control or reduce threats such that the species will no longer require the protections of the ESA. The recovery objectives include the following:

1. Achieve and maintain a self-sustaining population of sea otters in each MU.
2. Maintain enough sea otters to ensure that they are playing a functional role in their near-shore ecosystem.
3. Mitigate threats sufficiently to ensure persistence of sea otters.

The southwest Alaska DPS ranges from west to east across more than 1,500 mi (2,414 km) of shoreline, and sea otters occur in several distinct habitat types. The magnitude and pattern of the population decline has varied over the range and the cause(s) of decline also likely vary regionally. To address such differences, the recovery plan identifies criteria by MU (USFWS 2013; Table 3).

Specific actions to achieve recovery and delisting of the southwest Alaska DPS, specified in the recovery plan are:

4. Demographic criterion: The probability of the sea otter becoming endangered within 25 years would be less than five percent. Because of this criterion, population monitoring and population modeling are considered high priorities.
5. Ecosystem-based criterion: Greater than 50 percent of the islands need to be in the kelp- dominated state. This criterion applies to the Western Aleutians and Eastern Aleutians MUs only. Monitoring the status of the kelp forest ecosystem in these MUs is considered a high priority, as results from such monitoring will be needed to evaluate the ecosystem-based delisting criteria.
6. Threats-based criterion: Predation is considered to be the most important threat to recovery, so additional research on that threat is also a high priority. Other high-priority actions include identifying characteristics of sea otter habitat and ensuring adequate oil spill response capability exists in southwest Alaska.

The recovery plan states, “delisting may be considered when any three of the five MUs meets all of the recovery criteria specified” (USFWS 2013). Specific actions to achieve recovery are detailed in the plan.

3.4 Critical Habitat for the Southwest DPS of Northern Sea Otter

Northern sea otter critical habitat was designated on October 8, 2009 (74 FR 51988). A total of 5,855 mi^2 (15,164 km^2) of nearshore marine environment was designated in southwest Alaska. The physical or biological features essential to conservation of the species, and which may require special management considerations, were identified as PCEs in the northern sea otter critical habitat rule (74 FR 51988). The PCEs identified for sea otter critical habitat include the following:

1. Shallow, rocky areas where marine predators are less likely to forage, which are waters less than 2 m (6 ft) depth;
2. Nearshore waters that may provide protection or escape from marine predators, which are those within 100 m (328 ft) from the mean high tide line;
3. Kelp forests that provide protection from marine predators, which occur in waters less than 20 m (65 ft) depth; and
4. Prey resources in sufficient quantity and quality to support the energetic requirements of the species.

Table 3. Summary of sea otter recovery criteria listed by MU.

Criteria	Management Unit				
	Western Aleutian	Eastern Aleutian	Bristol Bay	South-Alaska Peninsula	Kodiak, Kamishak, & Alaska Peninsula
Demographic	< 5%	< 5%	< 5%	< 5%	< 5%
Ecosystem	>50% kelp dominated	>50% kelp dominated	None proposed	None proposed	None proposed
Threats	Threats adequately mitigated	Threats adequately mitigated	Threats adequately mitigated	Threats adequately mitigated	Threats adequately mitigated

Critical habitat for northern sea otters is divided into five MUs corresponding to the Recovery Units listed in the recovery plan: Western Aleutians; Eastern Aleutians; South Alaska Peninsula; Bristol Bay; and Kodiak, Kamishak, and Alaska Peninsula (Figure 11).

The physical habitat of northern sea otters is largely unaltered from natural conditions throughout the vast majority of the range of the southwest Alaska DPS. The human populations in most of the designated critical habitat are small, and development has been limited to the few, widely scattered towns, villages, and military installations. Developments that have physically modified sea otter habitat consist of docks, piers, and boat harbors, which are limited to nearshore waters immediately adjacent to towns, villages, and military bases. Some sea otters continue to use these sites. No trends in the condition of sea otter critical habitat are identified in the critical habitat designation, and the Service's recovery plan rates habitat loss as a low threat to recovery of the population (USFWS 2013).

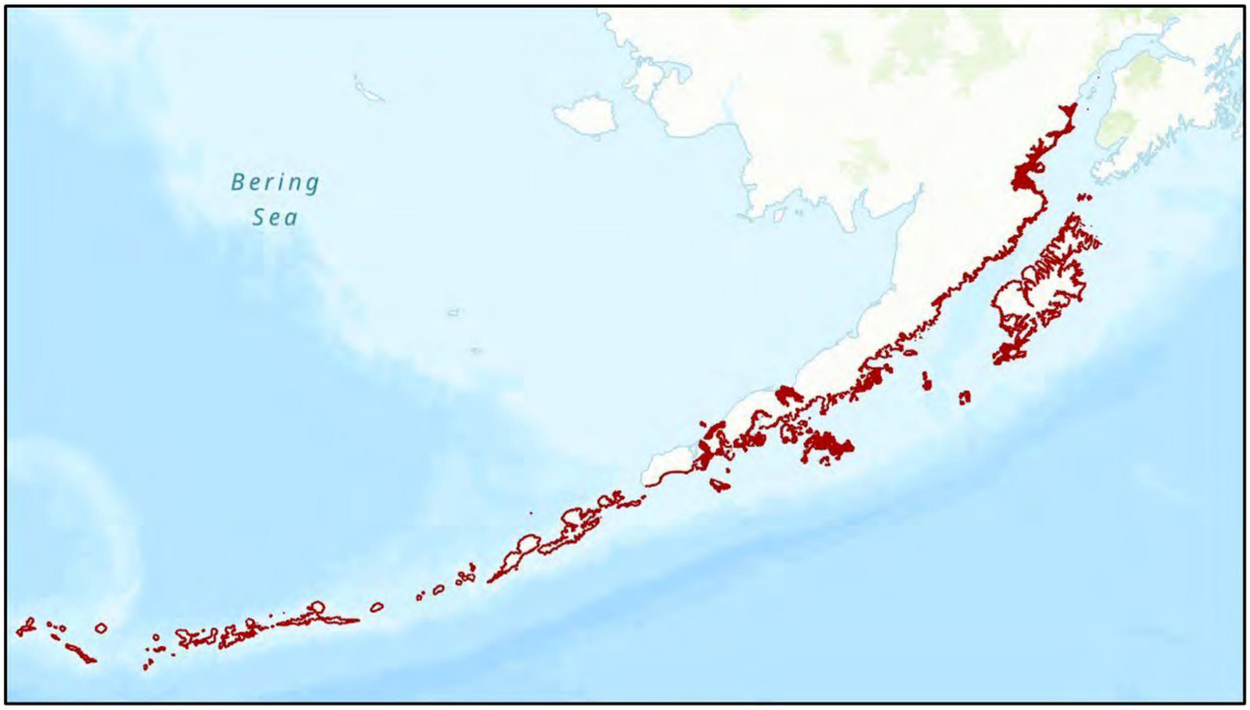


Figure 11. Designated northern sea otter critical habitat.

4 ENVIRONMENTAL BASELINE

Regulations implementing the ESA (50 CFR 402.02) define the environmental baseline as the condition of the listed species or its designated critical habitat in the action area, without the consequences to the listed species or designated critical habitat caused by the proposed action. The environmental baseline includes the past and present impacts of all federal, State, or private actions and other human activities in the action area, the anticipated impacts of all proposed federal projects in the action that have already undergone formal or early section 7 consultation, and the impact of State or private actions which are contemporaneous with the consultation in process. The impacts to listed species or designated critical habitat from federal agency activities or existing federal agency facilities that are not within the agency's discretion to modify are part of the environmental baseline.

4.1 Existing Conditions

4.1.1 Habitat

The isthmus in Izembek National Wildlife Refuge is a wetland complex that includes the interaction between uplands where the water table may be higher than the adjacent lowland containing a wetland; the isthmus serves as a divide between discharges to the north into the Bering Sea (including through tributaries to Izembek Lagoon) and to the south into Cold Bay and the Pacific Ocean (including through tributaries to Kinzarof Lagoon; DOI/USFWS 2013a). Wetlands do not function as discrete features on the landscape. Wetlands and hydrologically connected uplands serve to moderate the flows in streams running into Izembek and Kinzarof Lagoons. The continually saturated condition of the Izembek and Kinzarof marsh wetlands do not allow them to absorb water, but the dense vegetation and hummocky microtopography slows runoff. The wetland vegetation promotes sediment deposition during overbank flow conditions. The marshes' vegetation binds stream banks and the shoreline against erosive high flows, reducing bank erosion and its resulting turbidity and sedimentation. These tundra system wetlands likely have moderately high primary productivity and nutrient and element cycling. We expect they export organic materials that support the lagoon ecosystem, including the migrating, staging, and wintering waterfowl and migrating shorebirds for which Izembek and Kinzarof Lagoons are known (DOI/USFWS 2013a). During summer, these wetlands are used as breeding and foraging habitat for waterfowl, shorebirds, songbirds, and ptarmigan. Because of the abundance of surface water, the complex interspersion of seasonal open water and vegetation, and proximity to Izembek and Kinzarof Lagoons, these wetlands support several other species of water dependent wildlife. The wetland vegetation also provides some cover and contributes detritus and invertebrates to the streams that support fish and eventually flow into the lagoons.

The largest eelgrass beds in the world are found in Izembek Lagoon (Ward et al. 1997); eelgrass is also found in Kinzarof Lagoon and Cold Bay to a lesser extent. Eelgrass, and seagrass meadows more generally, are complex systems that support a large range of organisms (e.g., bacteria, invertebrates, juvenile and adult fish, waterfowl and other birds, and marine mammals) by providing nutrients (e.g., eelgrass leaves, seeds, and rhizomes) and supporting prey species populations; providing shelter (e.g., shade, cover, spawning substrate, and attachment surfaces); and providing physical stability (e.g., by buffering water currents, holding fine-grained sediment in place) (Phillips 1984, Longstaff and Dennison 1999, Gorgula and Connell 2004, ADF&G 2010, Watanabe et al. 2016, Picard et al. 2022). Seagrasses such as eelgrass stabilize and enrich sediments and provide an important base for a complex food web. Many of the invertebrates found in eelgrass are an important food resource for other invertebrates and for fish, birds, and other wildlife species. Species groups settling in, crawling on, or clinging to blades include *Caprella* shrimp, gastropods (*Margarites* spp., *Lacuna* spp.), bivalves (*Turtonia minuta*), and polychaets (McConnaughey 1978, Metzner 1993, USGS 2019). The helmet crab (*Telmessus cheiragonus)* is one of the most prominent invertebrates in Izembek Lagoon, with an estimated abundance at almost one helmet crab per square meter in the intertidal eelgrass beds (McConnaughey 1978). This crab forages on both eelgrass and invertebrates and is fed upon by sea stars, several species of fish, sea otters, red foxes, brown bears, common ravens, diving birds, waterfowl, sandpipers, and gulls. Eelgrass productivity is dependent on many factors including water quality, turbidity, and eutrophication. They are sensitive to both human and natural disturbance.

Kelp are large brown algae (*Phaeophyta*) that live in cool, relatively shallow waters close to the shore. Kelp forests are confined to rocky coastlines where they grow in nutrient-rich, cold, shallow water that allows ample photosynthesis. They harbor a high variety and high diversity of plants and animals with many organisms using the thick blades as a safe shelter for their young from predators or rough storms. Kelp forests provide food, shelter, and protection for a large range of organisms, including seals, sea lions, sea otters, invertebrates, fish, whales, birds, and more.

Canopy-covering brown kelps are widespread along the Gulf of Alaska coastline, from Castle Cape to the southwestern tip of Unimak Island, except for the southern side of Unimak Island (USFWS 2020). Dark brown bladed kelp is distributed along the Gulf of Alaska coastline, from Castle Cape to the southwestern tip of Unimak Island, except for the southern side of Unimak Island as well. Along the Bristol Bay coastline from Cape Chichagof on the north side of the Alaska Peninsula to the northwestern tip of Unimak Island, canopy-covering kelps and dark brown bladed kelp are few and scattered along the coastline (USFWS 2020).

4.1.2 Land Ownership

The action area is located between the Bering Sea and the Gulf of Alaska at the southwestern end of the Alaska Peninsula. The action area includes the entirety of the Izembek Isthmus; Kinzarof, Moffet, and Izembek Lagoon; and the marine waterbody of Cold Bay. Land ownership is primarily mixed between Tribal, State, and Federal lands, with some privately owned lands and some acreage with split surface and subsurface mineral rights. Portions of the action area are within the Izembek State Game Refuge (Figure 12). There is some overlap between Izembek State Game Refuge and Izembek Refuge boundaries, and the ADF&G and Izembek Refuge split management of the area and resources in the area. Specifically, below mean high water, the State of Alaska manages Izembek Lagoon and other areas of overlap between the Izembek State Game Refuge and the Federally managed Izembek Refuge.

Portions of the action area and surrounding lands were first Federally protected as the Izembek National Wildlife Range in 1960, established through Public Land Order 2216 (25 FR 12599-12600) as a breeding ground and management area for all forms of wildlife and recognized by the Department of Interior as, "contain[ing] the most important concentration point for waterfowl in Alaska." In 1980, Congress redesignated the Izembek National Wildlife Range as the Izembek National Wildlife Refuge under ANILCA; concurrently, under the Wilderness Act, Congress designated 300,000 ac (121,406 ha) of Izembek Refuge as Izembek Wilderness.

On October 21, 2025, the United States Department of Interior signed an agreement with KCC for a land exchange. Immediately afterwards, the United States conveyed approximately 490 acres of land to KCC, and KCC conveyed to the United States approximately 1,739 acres of lands in the vicinity of Kinzarof Lagoon. In addition, KCC relinquished its selection rights under ANCSA to 5,430 ac located within the Izembek Refuge on the east side of Cold Bay.

4.1.3 Existing infrastructure

King Cove is located on the southeast side of the Alaska Peninsula, and vessel or land-based access to the north side of the Alaska Peninsula is currently logistically complicated for King Cove residents. Although there are roads in King Cove (including from King Cove to the Northeast Hovercraft Terminal site at the Izembek Refuge boundary) and roads in Cold Bay (including from the Cold Bay Dock to the Cold Bay airport and to a boat launch into Izembek Lagoon), there are no existing overland roads between the communities of King Cove and Cold Bay. People must take an aircraft or boat to get from one community to the other.

The existing Cold Bay ferry terminal was constructed by the State of Alaska in 1978. The existing infrastructure consists of the original 1,320-ft (402-m), pile-supported, concrete panel approach trestle; a 100-ft by 40-ft dock (30-m by 12-m); a mooring dolphin; a catwalk; and an expansion that added a 360-ft by 60-ft (110-m by 18-m), pile-supported, timber-decked structure in 1993. A refurbishment effort in 2015 consisted of repairs to or replacement of some of this infrastructure. Cold Bay harbor is classified as a small harbor, with 650 ft (198 m) of space for transient moorage (Himes-Cornell et al. 2013). The harbor does not currently allow for permanent moorage.

The existing ferry terminal is reached overland via the existing road system, at the terminus of Dock Road, or via boat access through the Cold Bay embayment. Boat access at the City of Cold Bay is limited to the existing ferry terminal, where currently passengers either have to climb a steel ladder or be lifted to the deck of the dock via a winch system used to load/unload cargo from fishing boats (DOI/USFWS 2013*a*). Additional improvements at the harbor include a fish cleaning station and dockside fuel, electrical, and water utilities (Himes-Cornell et al. 2013). ADOT&PF is currently planning a reconstruction of the ferry terminal, with construction expected to begin in May 2028 and take 18 months to complete.

The Cold Bay harbor can provide transient moorage for vessels up to 320 ft (98-m) long (Himes-Cornell et al. 2013). Cold Bay receives monthly marine cargo services and bi-monthly ferry service and can accommodate Coast Guard regulated vessels, rescue vessels, cruise ships, and fuel barges. Cruise ships visit periodically (Himes-Cornell et al. 2013). Typical regularly scheduled barge sailings to this region include once weekly barge service from Seattle to King Cove or Cold Bay (ADOT&PF 2026*b*).

Although it may be feasible for King Cove residents to boat across Cold Bay, pull a boat out of the water, and use the road network to access the boat launch on Outer Marker Road that would allow vessel-based access to Izembek Lagoon, we assume this does not occur regularly due to logistical limitations. Boating from King Cove to the northwest side of the Alaska Peninsula would be a lengthy and difficult undertaking, requiring passage through False Pass (which is not navigable by all vessels) or boating even farther around. Given these circumstances and the lack of data regarding King Cove subsistence activities, including location of subsistence activities, we assume King Cove residents currently perform most subsistence hunting and fishing in areas on the southeastern side of the Alaska Peninsula at present.

The King Cove harbor can hold 50 small vessels (up to 60 ft [18.3 m] long) and 46 large vessels (up to 150 ft long [45.7 m]). The deep-water pier also serves as a docking point for vessels up to 330 ft (100 m) long, such as the state ferry, cargo ships, and cruise vessels (City of King Cove 2025). We assume some number of smaller skiff-type vessels (hard-bottomed and/or inflatable, motorized vessels) are owned by residents of King Cove, although data to quantify this number are limited. Based on data reported by ADOTP&F in their addendum to the BA (ADOTP&F 2026d), available DMV registration data (current as of April 20, 2026) identified 95 powered boats in the registration universe; however, only 24 powered boats appeared to have current registrations as of that date. Those currently registered powered boats consisted of 14 open motorboats, 6 boats classified as “other,” and 4 cabin motorboats. None of the currently registered powered boats are classified as “RUNABOUT/SKIFF.” While some open motorboats may be capable of use in protected waters, the registration record does not show a current fleet of registered runabouts or skiffs readily available for repeated trailered transport from King Cove to Grant Point.

One of the largest fish processing facilities in Alaska is located in King Cove, although this plant was closed in 2024. The Peter Pan Seafoods cannery has the infrastructure to employ up to 500 seasonal employees; in the past, these employees tended to be non-residents (i.e., they did not meet the subsistence use qualification requirement of being a resident for 12 consecutive months). Product was typically shipped to market by boat or barge; to a lesser extent, product was shipped by air service from the Cold Bay Airport (after first being loaded onto a boat and transported across Cold Bay).

4.1.4 Resource Management

Prior to establishment of the Izembek Refuge, the Izembek Wildlife Range Master Plan (1969) set forth to manage this area so it would remain in as natural a condition as possible, in order to maintain its high value for wildlife (USFWS 1969, 1985). The master plan specifically noted protection of drainages as vital to the function of the range because altering natural hydrology could have serious effects to wildlife habitat, including eelgrass. The master plan emphasized the following activities must be kept to a minimum: soil disturbance, public facilities, and human activities. When re-designating this area as Izembek Refuge, Congress established four purposes for the designation:

i. To conserve fish and wildlife populations and habitats in their natural diversity, including but not limited to waterfowl, shorebirds, and other migratory birds, brown bears and salmonids;
ii. To fulfill the international treaty obligations of the United States with respect to fish and wildlife and their habitats;
iii. To provide, in a manner consistent with the purposes set forth in subparagraphs (i) and (ii), the opportunity for continued subsistence use by local residents; and
iv. To ensure, to the maximum extent practicable and in a manner consistent with the purposes set forth in paragraph (i), water quality and necessary water quantity within the refuge.

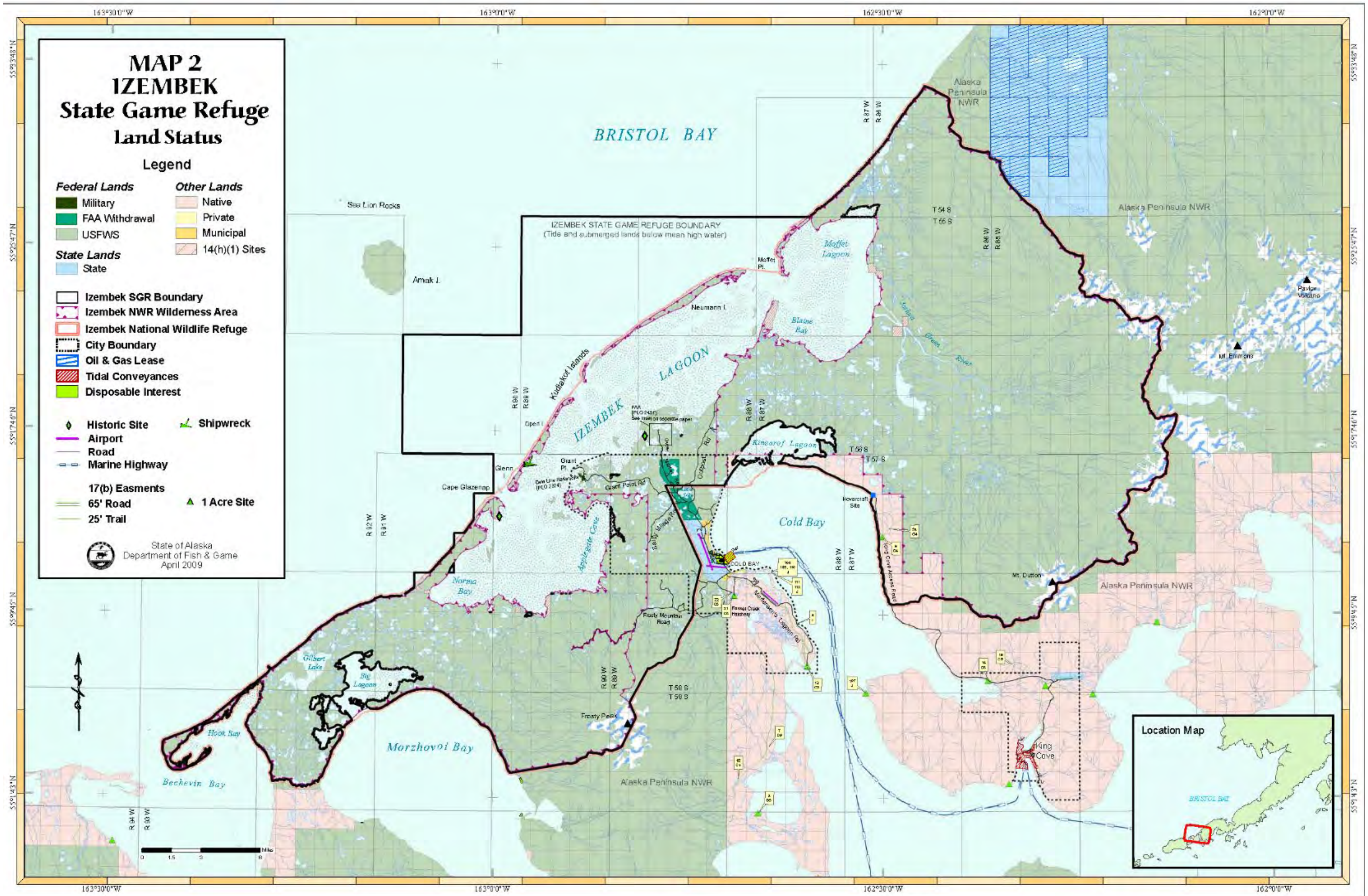


Figure 12. State Game Refuge boundary and overview of land status in the action area prior to the 2025 land exchange.

With the establishment of the Izembek Wilderness, Congress recognized the wilderness area contained watersheds critical to Izembek Lagoon, and specifically recognized the lagoon's eelgrass beds serve as habitat for millions of waterfowl. Congress identified designation of the Izembek Wilderness was for the purpose of protecting critically important habitat by restricting access to the lagoon. Izembek Refuge is also designated as a Wetland of International Importance (Ramsar Site Number 349, established in 1986), under the Ramsar Convention on Wetlands (Convention), an intergovernmental treaty to which the United States is a Contracting Party. This site qualifies for this Ramsar designation under six of the nine criteria agreed upon by the Convention (Ramsar 1971).

The ADF&G and Izembek Refuge share management of natural resources and use of those resources (e.g., fishing and bird hunting) in this area (Sowl et al. 2021). The State Game Refuge and Izembek Refuge share boundaries with some overlap, but some areas only managed by one entity. According to the ADF&G, the area hosts, "one of the largest eelgrass beds in the world; the State Game Refuge is known internationally for the number of waterfowl and shorebirds that feed in the Izembek Lagoon eelgrass beds during spring and fall migrations" (ADF&G 2010). The important eelgrass ecosystem provides habitat for Steller's eiders and sea otters, and other species of conservation concern are also found in this area. Due to the importance of Izembek Lagoon and its extensive eelgrass beds to multiple species of waterfowl and other wildlife, State- and federally sponsored research has been conducted actively in this area, including aerial surveys, bird banding work, and sampling and mapping of the eelgrass beds and benthic community.

The ADF&G allows activities such as recreational wildlife viewing, fishing, and hunting within the Izembek State Game Refuge (ADF&G 2010; 5 AAC 95.552). Low intensity use is permitted by the ADF&G through Special Area Permits; "low intensity" is defined as "insignificant or inconsequential" (ADF&G 2010). Other uses of Izembek State Game Refuge could be allowed under a Special Area Permit issued by ADF&G, including natural resource exploration and development. Permitted fishing includes commercial salmon seining within the lagoon and drift gillnet salmon fishing offshore of the barrier islands.

Izembek Lagoon is unique in the diversity and aggregation of waterfowl that it hosts during hunting seasons and is considered a prime waterfowl hunting location. Both subsistence and recreational sport hunting occur within the area. Commercial guiding for the fall general hunt also occurs within the area, as authorized by Izembek Refuge under Special Use Permits. Other allowable uses under the Special Use Permits issued by Izembek Refuge for commercially guided hunts include beachcombing, walrus viewing, and ivory hunting.

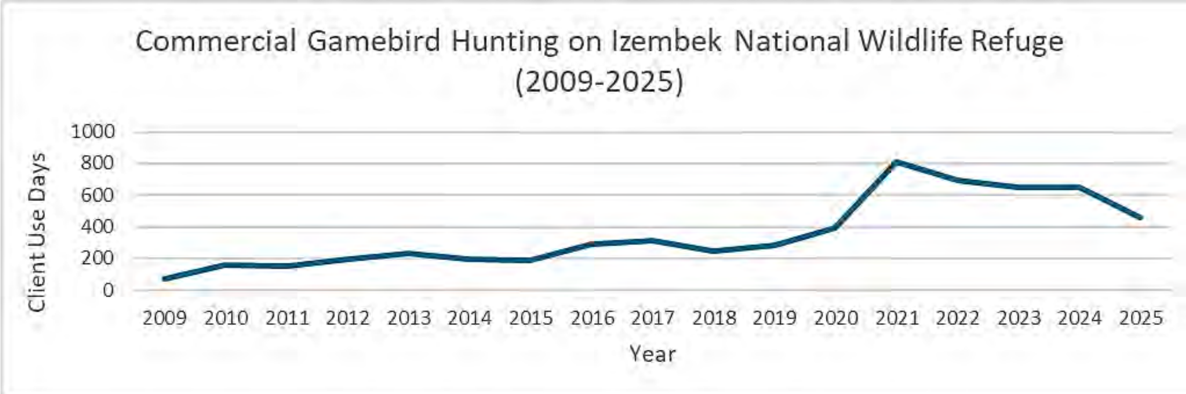
The State of Alaska (5 AAC 92.540) has established a Controlled Use Area restricting motorized vehicles (except outboard moto-powered boats) for hunting, including the transport of hunters, their gear, or game parts. The Controlled Use Area consists of the portion of Izembek National Wildlife Refuge, commonly known as the Left Hand Valley and Right Hand Valley, bounded on the west by a line beginning at Moffet Point and continuing easterly and southerly around Moffet Lagoon along the mean high tide line to Blaine Point (locally known as Strawberry Point), then southerly along a line to the northern shore of Kinzarof Lagoon, continuing easterly and southerly around Kinzarof Lagoon along the mean high tide line to a point on the eastern entrance of Kinzarof Lagoon; bounded to the south, east, and north by the Izembek NWR boundary

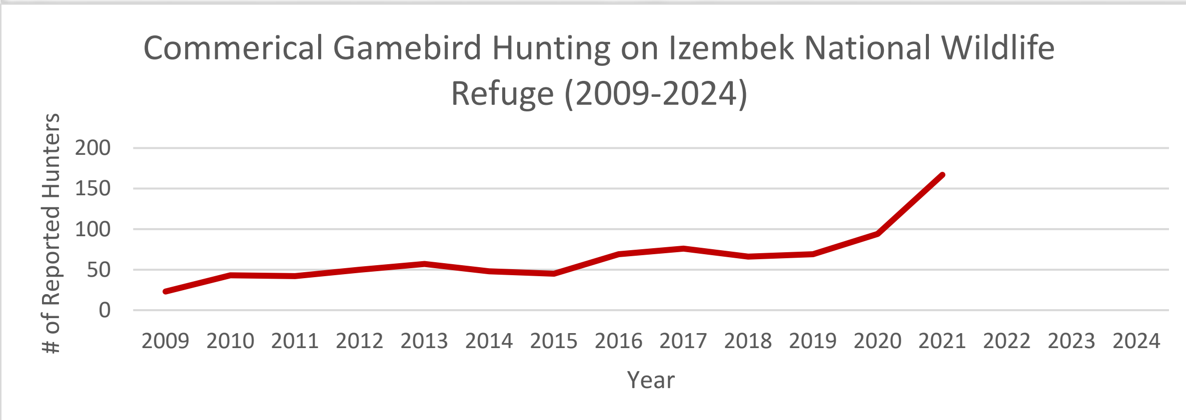
4.1.5 Waterfowl Hunting

Commercially guided hunting effort and harvest on Izembek Refuge are reported to the refuge as a condition of special use permits. Hunting targets various taxa, but waterfowl hunting is the activity overlapping areas used by Steller’s eiders and northern sea otters. Commercially guided gamebird hunting, which is focused on waterfowl hunting, has increased sharply in the Izembek Refuge during the most recent 5-year period (USFWS, Izembek Refuge, unpublished data; see Figure 13). This increase reflects an increase in interest, increased availability of guides (historically there were only two; in 2010 a third guide service began operation and in 2021 a fourth guide service began operation), and a change in waterfowl hunting methods and modes of access. Specifically, hunting of waterfowl traditionally occurred from shoreline areas accessible by foot traffic; but increased use of watercraft of various types have made more areas of Izembek Lagoon, including open water areas and shallow offshore areas, available to hunters (M. Fosado, USFWS, pers. comm. 2025). Waterfowl hunting takes place from the water and from the shoreline. The Izembek Refuge issues special use permits for commercial activities, such as guided hunting, that access refuge lands. The refuge does not cap the number of special use permits for commercially guided hunts nor the number of client use days (hereafter, CUDs; defined as the number of days a hunter was taken on the refuge by a commercial guide; a single trip onto the refuge will contribute multiple CUDs when multiple clients are guided at once, and multiple trips by the same client on the same day will only constitute a single day) under permits it issues (M. Fosado, pers. comm 2025).

Non-guided sport hunting, including of waterfowl, also occurs in this area on both State and Federal lands. Hunters may access the area on foot or via private boats or vessels, which may be transported on the State Ferry or rented locally. Except for guided hunts, the Refuge does not issue permits for hunting, and data on sport and subsistence hunting effort and harvest are not available through any formal reporting channels. However, the trends in commercially guided hunting generally align with anecdotal observations of increased hunting on Izembek Refuge generally since 2020 (M. Fosado, pers. comm. 2025).

During the fall through winter months, subsistence and non-subsistence users can harvest waterfowl; this general hunt is typically open October through mid-December for ducks and sea ducks and September through mid-December for brant. In 2025 and 2026, the brant harvest season was shortened to October 1 through November 20. The spring-summer subsistence hunt is only open to qualified Alaska residents (i.e., residents of rural communities who have maintained residency for 12 consecutive months). The subsistence hunt occurs in the Central Unit of the Aleutian-Pribilof Islands management region during April 2 to June 15 and July 16 to August 31; however, there is a black brant season closure at Izembek and Moffet Lagoons during August 16 to 31 (50 FR 92; 2025 regs). Harvest of Steller’s eiders is prohibited at all times.





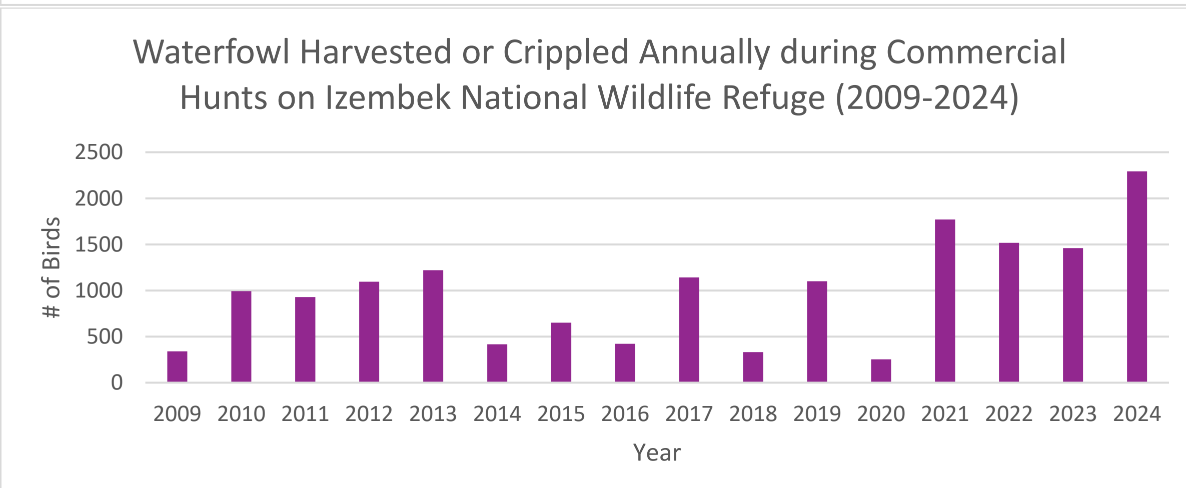


Figure 13. CUDs (top panel; CUDs are the number of days a hunter was taken on the refuge by a commercial guide, so a single trip onto the refuge will contribute multiple CUDs when multiple clients are guided at once, and multiple trips by the same client on the same day will only constitute a single day); number of hunters per year (middle panel; data were not available for 2022-2025); and waterfowl harvested or crippled annually (bottom panel), as reported during commercially guided gamebird hunting on Izembek Refuge. These data include upland gamebird hunting efforts, although those efforts are usually combined with waterfowl hunting. Source: USFWS, Izembek Refuge, unpublished data.

4.1.6 Fishing

Commercial fishing is the primary economic activity in the region and Cold Bay is considered part of a fishing network connecting King Cove, Sand Point, and False Pass. No commercial fishing vessels are reported to use Cold Bay as a base of operations during the fishing season, although Cold Bay may receive some fisheries-related revenue through port, dock, and harbor usage fees (Himes-Cornell et al. 2013). Sand Point is home to the largest fishing fleet in the Aleutian chain (City of Sand Point 2014), while other communities within the region, including King Cove, also have strong ties to commercial fishing. Most Cold Bay residents fish out of King Cove or other communities rather than out of Cold Bay (Himes-Cornell et al. 2013). Fish processing facilities exist within the region in the communities of False Pass, King Cove, Sand Point, and Chignik.

Commercial fisheries in the vicinity of Cold Bay include longline groundfish (halibut), salmon gillnet, and longline saltwater finfish fisheries (Himes-Cornell et al. 2013). Generally, salmon fishing occurs in this region from June through August and halibut fishing occurs July through November. The action area is included within commercial finfish fisheries management area "M" (Figure 14). During 2023 and 2024, there were 392 and 390 (respectively) eligible commercial salmon permits in management area M, with 275 and 235 commercial landings (ADF&G unpubl. data). This represents a decline in commercial fishing activity in this management area; during the late 1970s to approximately mid-1990s, approximately 350 to greater than 400 commercial permits were fished. A change in management strategies for the South Unimak and Shumagin Island sub areas (Keyse et al. 2024) could have contributed to the decline in fishing effort in this management area.

All reported commercial harvest in management area M during 2023 and 2024 occurred in the "North Peninsula" and "South Peninsula" sub areas. Within management area M, commercial fishing is permitted and has been reported within portions of the action area, including within Izembek Lagoon and Moffet Lagoon (Figure 15). Fifteen to 22 commercial fishing permit holders fished the Northwestern District of Area M (which includes Izembek Lagoon) in 2023 and 2024 respectively. In 2023, these included 5 purse seiners, 10 drift gillnets, and 0 set gillnets; in 2024, these included 4 purse seiners, 17 drift gillnets, and 1 set gillnet (ADF&G unpublished data). Drift gillnets are not allowed within Izembek and Moffet Lagoons but are allowed in Bristol Bay, just offshore of the barrier islands that enclose the lagoon; the other gear types are allowed within the lagoon system. At least 90 commercial fishing vessels operate out of King Cove (Bernton and Herz 2025). Best available information from 2017 suggests 50 commercial fishing vessels and one recreational vessel are registered in King Cove, and 16 commercial fishing vessels and no recreational vessels are registered in Cold Bay (BoatInfoWorld 2017). Per the BA Addendum, the King Cove DMV identifies 95 powered boats in the registration universe; however, only 24 powered boats appear to have registrations as of April 20, 2026 (ADOT&PF 2026d).

Subsistence fishing activities also occur within the action area, although exact locations of these activities are not available. Salmon fishing in State managed waters, including in Izembek Lagoon, is regulated with some timing restrictions (5 AAC 09.320 (b)(1)). A majority of eligible households in Cold Bay and King Cove participate in subsistence activities, including fishing (primarily for salmon). In 1992, there were 158 eligible households in King Cove, which increased to 172 eligible households in 2016; there were also 32 eligible households in Cold Bay in 2016 (ADF&G 2025). The number of subsistence fishing permits issued in both communities has declined through time; in 1992, 61 subsistence fishing permits were issued in King Cove, increasing to 68 in 2003 then decreasing to approximately 26 by 2016 and 16 by 2023 (ADF&G unpublished data). In 2007, there were 31 permits issued in Cold Bay, declining to approximately 19 by 2016 and 9 by 2023 (ADF&G unpublished data). This declining trend could reflect the tie between commercial fishing and subsistence fishing activities and the implementation of a limited entry permit system in management area M, with fewer commercial fishing permits held by local residents.

Some amount of saltwater recreational fishing occurs in Cold Bay, primarily by residents but with a small number of sportfishing licenses sold to non-residents and sportfishing services advertised by local lodges. Private anglers target salmon, halibut, lingcod, and Pacific cod via private boats (Himes-Cornell et al. 2013).

4.1.7 Motorized Use

Cold Bay, Kinzarof Lagoon, and the Izembek Isthmus are located between the communities of King Cove and Cold Bay. In the past, Izembek Lagoon, the isthmus, and more remote parts of Izembek Refuge were accessed by hiking or boating from nearby communities, often on multi-day trips (USFWS/Williams 2023). Izembek Lagoon is currently accessed via wheeled, fixed-wing aircraft landing on unimproved beaches, and by boat via an unimproved boat ramp connected to the Cold Bay road network, or via passage from Bristol Bay through a gap in the barrier islands. Motorized travel occurs in this area along old military roads and trails, and unsanctioned motorized travel has substantially increased in the action area in areas without preexisting trails. This is particularly noticeable within the east Izembek Wilderness area, as access roads and other infrastructure have expanded from the local communities and made the isthmus more accessible for off-road travel on both authorized and unauthorized routes (see Figure 16; USFWS/Williams 2023).

With establishment of the Fort Randall Air Base in 1941 (USFWS 2003), the military developed a road network around the base, which continues to be used extensively by Cold Bay residents for access to hunting, fishing, and other activities. Vehicles began crossing over land during World War II; and non-military, off-road vehicles have continued to cross the isthmus using these old military trails. Motorized vehicle use within the Izembek Refuge has generally been confined to existing roads and trails, and historically consisted of irregular and isolated occurrences of off-road use through the tundra (USFWS 2003).

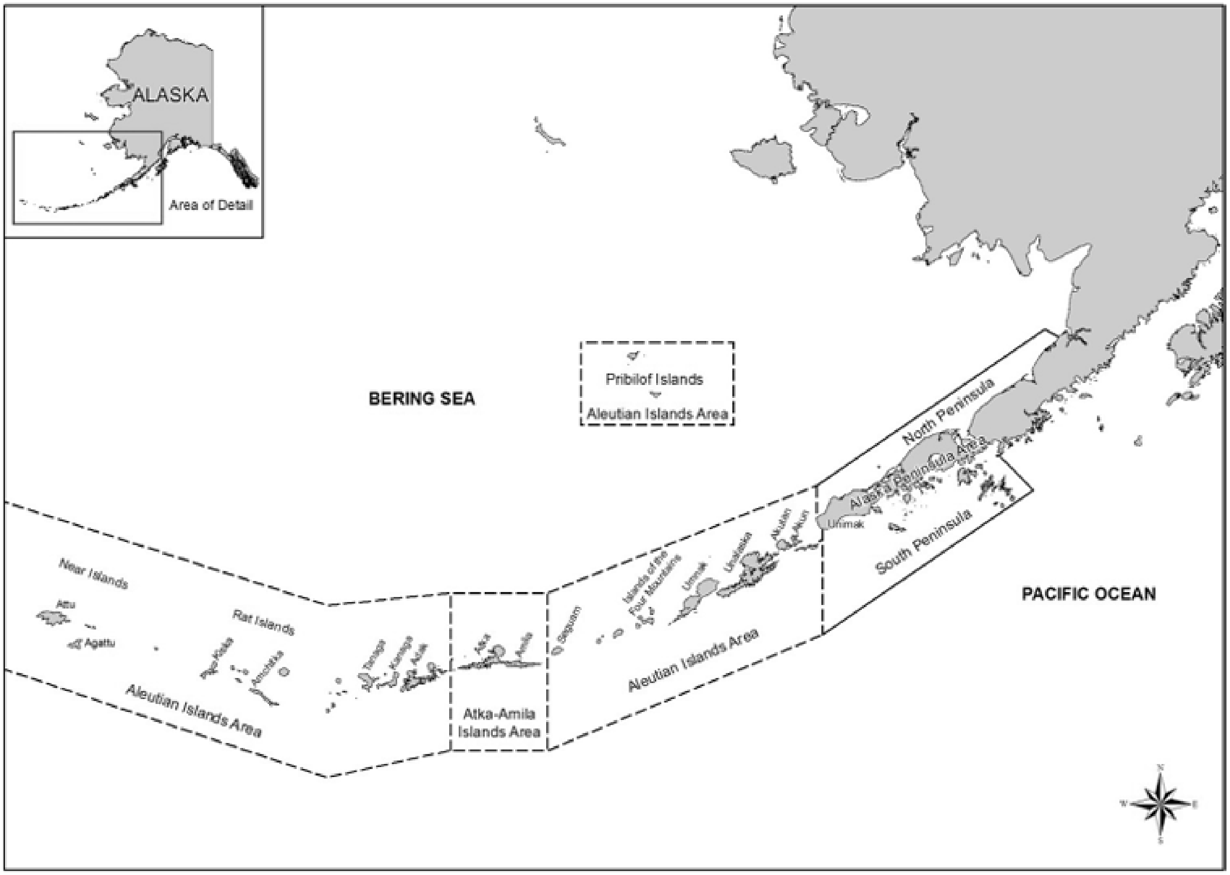


Figure 14. Map of the Aleutian Islands, Atka-Amlia Islands, and Alaska Peninsula Management Areas for commercial finfish fisheries, also known as "Area M." Map from: *https://www.adfg.alaska.gov/static/applications/dcfnewsrelease/1642226461.pdf*

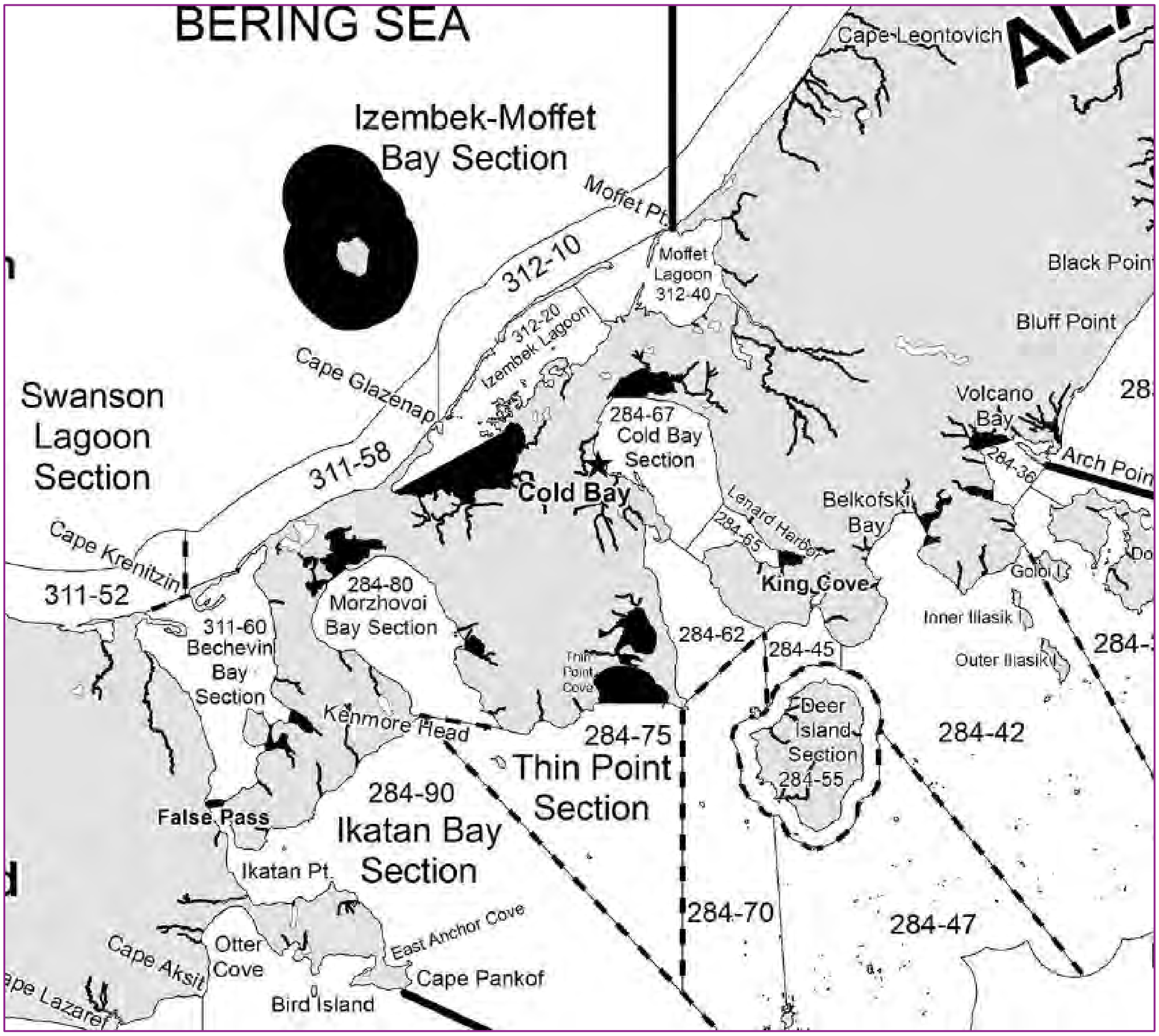


Figure 15. Commercial Finfish Fishing within the Alaska Peninsula Management Area, zoomed in to those waters surrounding the action area. Areas where commercial fishing is not permitted are depicted as black polygons. Larger map available from ADF&G: *https://www.adfg.alaska.gov/static/fishing/pdfs/commercial/akpeninsula_stat_map.pdf*

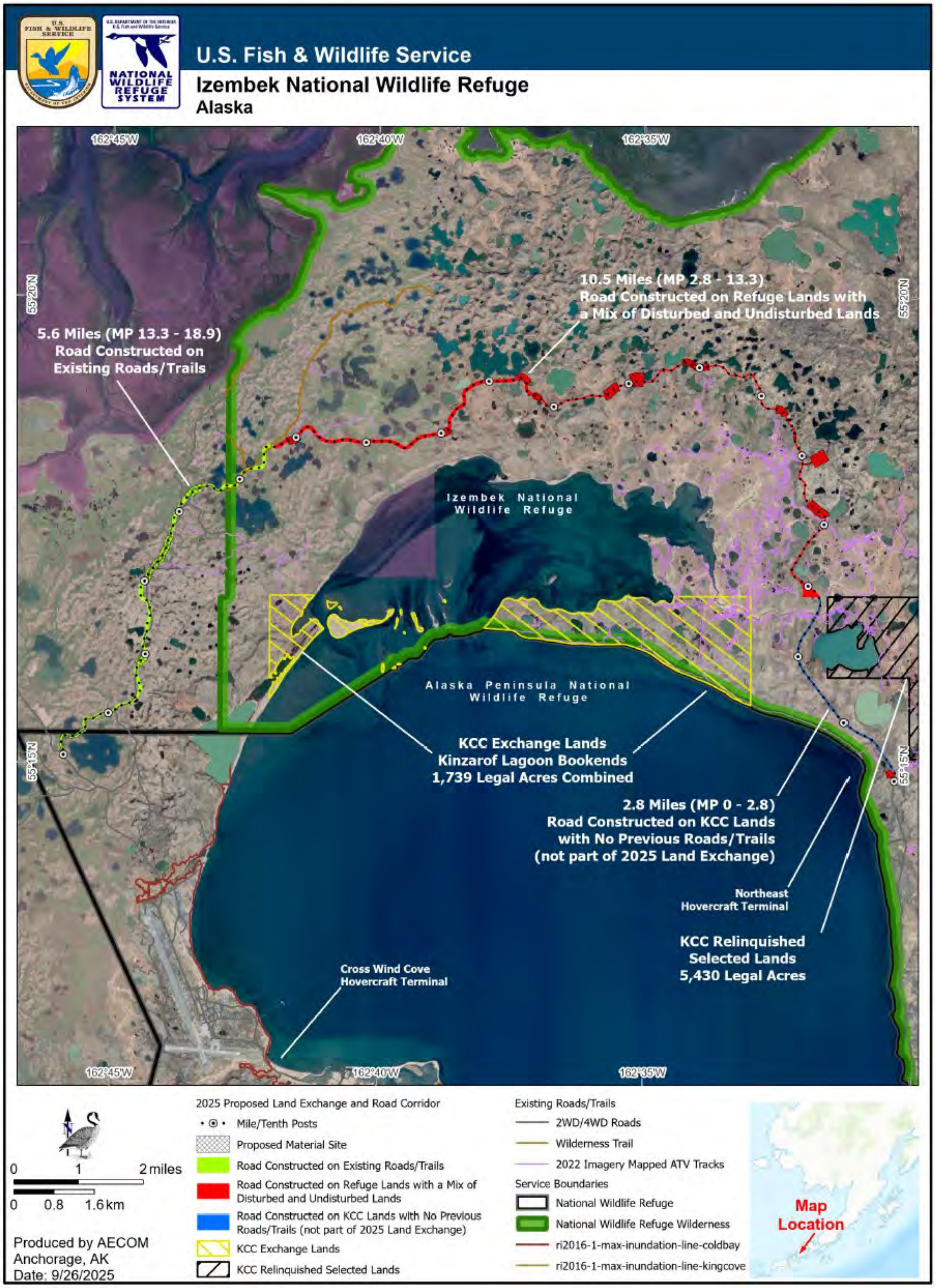


Figure 16. Proposed road corridor and existing roads and trails (shown in purple).

In the last two decades, a substantial increase in off-road vehicle trails on the east side of Cold Bay, including within the Izembek Refuge boundary and into Izembek Wilderness, followed construction of the 17.2-mi (27.7 km) King Cove extension, a road from the community of King Cove to the northeast hovercraft terminal at approximately the Izembek Refuge boundary. A comparison of trails in 2004 imagery to trails in 2022 imagery showed a substantial increase in off-road vehicle trails after the road extension, from 17.3 mi (27.9 km) in 2004 to 140.8 mi (222.6 km) in 2022. Some of these trails may have been formed during authorized and/or traditional customary uses however numerous (an estimated 93 mi [151 km]) are single-use and likely unsanctioned trails (USFWS/Williams 2023). Currently, in the limited portions of the refuge where roads have facilitated off-road access, trails and trail scars crisscross the landscape. This includes areas deep into congressionally designated Wilderness, such as Moffett Lagoon and the Joshua Green River (USFWS/Williams 2023). We expect off-road use is highest during peak periods of subsistence activities (e.g., hunting, berry/plant gathering), which is expected to overlap the presence of Steller's eiders in the late summer and fall.

Although motorized, off-road travel is generally not allowed within the Izembek Refuge except on a few designated routes (and except where it pertains to subsistence), the ADF&G may allow ATV use below mean high water of Izembek Lagoon under an individual Special Area Permit. In addition, the State allows use of certain motorized vessels (e.g., skiffs, fishing vessels, and inflatable boats) within Izembek Lagoon under a general permit. The Izembek State Game Refuge Plan notes, "impacts to refuge habitat and disturbance and displacement of waterfowl from increasing boat traffic, particularly from large horsepower outboard engines, shallow draft boats, and commercial fishing boats have been identified as a growing concern" (ADF&G 2010).

A boat ramp at Grant Point provides vessel access to Izembek Lagoon. The boat ramp is an unimproved, curved road that leads to the lagoon and is only usable during tides above 1 foot (0.3 m) given the shallow nature of the lagoon. Above mean high tide, the boat ramp is under Service jurisdiction while below mean high tide line it is under State jurisdiction. The ramp is open for public use and there are no restrictions on use (e.g., timing restrictions). It sees highest use in the fall during commercial waterfowl guiding.

4.1.8 Noise

Current sound levels in the action area are assumed to be very low, given the general lack of significant human activity in most of the area. Ambient noise levels within the Izembek Refuge are estimated as 40 to 50 A-weighted decibels (dBA) and depend on specific location and wind and wave conditions (ADOT&PF 2026*b*). Activities that add to the background noise environment include commercial fishing, air transportation from Cold Bay Airport and King Cove Airport, and commercial fishing and seafood processing in the City of King Cove. Human-made noises include boats, hunting activities, aircraft access to and from the Cold Bay Airport, aircraft access by sports hunters and recreationists, all-terrain vehicles, and snow machine travel. These noise sources are generally temporary and intermittent.

4.1.9 Izembek Complex Resources of Concern

The unique value and high function of the holistic Izembek Complex underpin multiple Federal, State, and international management designations in the action area. Steller's eiders, sea otters, and eelgrass ecosystems are the top three priority Resources of Concern identified by the Izembek Refuge (Sowl et al. 2021). Izembek Lagoon has one of the largest eelgrass beds in the world, with eelgrass covering approximately 40 to 47 percent of the lagoon (Figure 17). Kinzarof Lagoon also has extensive eelgrass cover (Ward et al. 2022). Izembek Lagoon has recently experienced a loss of eelgrass habitat (Douglas et al. 2025); future loss might be mitigated by protecting the physical and biological characteristics that help sustain eelgrass in this region (Hogrefe et al. 2014).

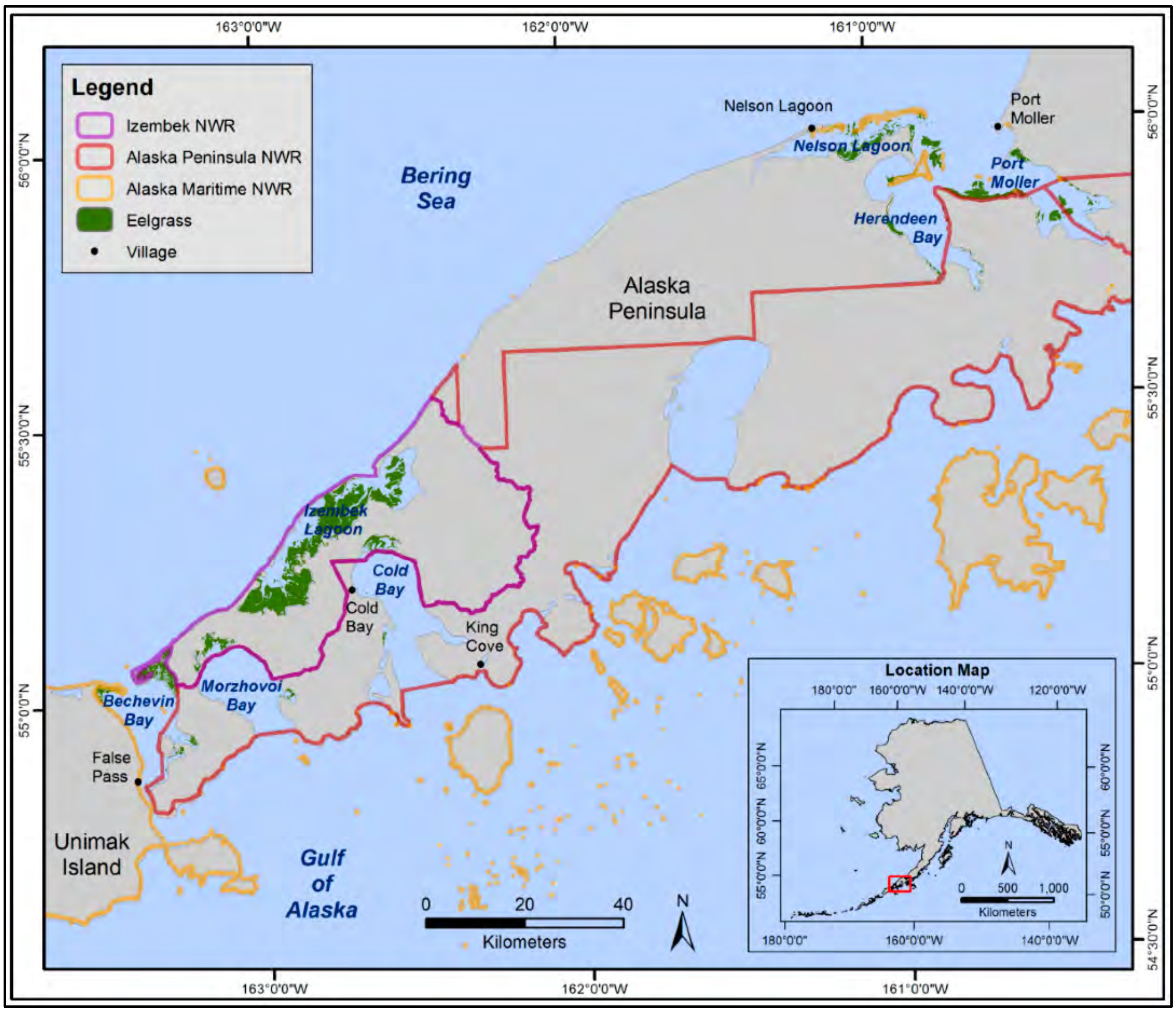


Figure 17. Distribution of eelgrass (*Zostera marina*) at Izembek Refuge (Hogrefe et al. 2014).

4.1.10 Past Use

The City of Cold Bay and surrounding area has experienced various military activities over approximately the last century. Thornbrough Air Force Base (originally Fort Randall Army Airfield) was built during World War II and eventually redeveloped into the current Cold Bay Airport. In the early 1900s, the U.S. Coast Guard established a lighthouse and Long Range Navigation stations at Cape Sarichef and Scotch Cap on the southwest coast of Unimak Island, just south of Cold Bay. In the late 1950s, the U.S. Air Force constructed Distant Early Warning facilities at Cape Sarichef (USFWS 2004*a*). These sites are no longer active but remain in military ownership.

Most contaminants identified within the Izembek Refuge and surrounding region are associated with past military use. Previous military activity left behind abandoned military housing and other debris, including unexploded ordnances (USFWS 2004*a*). An unexploded ordnance was discovered on Izembek Refuge as recently as 2023 (Greenly 2023).

Contaminated sites are catalogued by the Alaska Department of Environmental Conservation (ADEC). The ADEC catalog does not identify contaminated sites within the proposed road corridor or in other lands proposed for exchange (ADEC 2025). In 2025, environmental site assessments were conducted in the action area on the 2025 Izembek exchange lands, to identify conditions indicative of releases or threatened releases of hazardous substances, pollutants, contaminants, petroleum or petroleum products, and controlled substances to identify and evaluate recognized environmental conditions affecting the properties (ChemTrack Alaska 2025a, 2025b). These assessments used aerial photograph surveys, well surveys, and review of agency databases; however, they did not include on-site reconnaissance. No recognized environmental conditions were identified for the exchange lands; the assessment recommended further evaluation of formerly used defense site areas on the Refuge lands that were transferred to KCC, specifically to include a survey for unexploded ordnance, prior to ground disturbance.

Of the four water sources preliminarily identified for use during road construction and maintenance, one (Blinn Lake) is reported by the ADOT&PF to be contaminated with per- and polyfluoroalkyl substances (PFAS; A. Williams, USFWS, pers. comm 2024). This 150-ac (60.7-ha) lake is unconnected to anadromous waters and is not currently a point-source for PFAS to enter the local wetland complex and connected lagoon systems. Given its status as potentially contaminated with PFAS, Blinn Lake was subsequently removed as a potential water source for this project.

The Environmental Protection Agency (EPA) and ADEC consider the embayment of Cold Bay to be an “impaired waterbody” (under category 4B: “under alternative waterbody improvement plan”) (ADEC 2020*a*). There are many former and active contaminated sites in the Cold Bay region, with many of the contaminants related to and persisting from past military activities. Three active sites, cataloged by ADEC, are located within 1,500 ft (457 m) of the proposed project site:

1. A former military drum disposal/seep area, leftover from Fort Randall Army Airfield, covering approximately 15 ac (6 ha) of land along the shoreline of the bay. Hydrocarbons

from this drum disposal area have seeped onto the beach from the base of the bluff. Although all known contaminant sources have been removed, free phase petroleum hydrocarbons are present in the water table (ADEC 2026).

2. The 2015 release of approximately 679 gallons (2.57 m^3) of ultra-low sulfur diesel fuel at the Cold Bay Dock by the Frosty Fuels Tank Farm dock pipeline. Remediation efforts have included excavation and disposal of 30 cubic yd (23 m^3) of contaminated soil. Nitrogen fertilizer was sprayed on the area to enhance bioremediation, and the spill area was capped with a 4-ft (1-m) gravel cap. Testing and monitoring are ongoing, and pollutant levels remain unacceptably high (ADEC 2026).
3. A petroleum, oil, and lubricant storage area in the location of the current "Cold Bay RRS POL Tank Farm." This storage area contained two, 70,000-barrel aboveground storage tanks, a pump house, a fueling island, and associated piping. The tanks and piping were demolished in 1994. Contaminated soil was discovered inside the duke and near the former pump house in 1993 and in 1996, with high levels of pollutants detected in groundwater shortly thereafter. The contaminated soil was excavated and disposed of in 2003, and testing and monitoring continue (ADEC 2026).

Additional sources of pollution in the area include a permitted residential sewage lagoon outfall, located approximately 0.7 mi (1.1 km) north of the ferry terminal/public dock site, which discharges treated effluent into Cold Bay. The lagoon is under an enforcement action by the ADEC for several permit violations, including a total of 40 effluent parameter exceedances between June 2021 and November 2024 (ADEC 2025).

4.2 Status of Steller's Eider within the Action Area

The Izembek Lagoon complex (i.e., Izembek, Moffet, and Kinzarof Lagoons and Cold Bay; "Izembek Complex") provides important habitat for Steller's eiders during the molting and wintering period; during these periods, Steller's eiders undergo complete flight feather regrowth and conduct foraging, resting, and pair bonding and courtship behavior. A small number of Steller's eiders have also been known to remain along the Alaska Peninsula during the summer months, with a few individuals spending the summer at Izembek Lagoon.

Note the literature typically references Steller's eiders in "Izembek Lagoon," which is also the naming convention used in this biological opinion in section 3.1.2. Generally, any mention of Izembek Lagoon could be inclusive of all waterbodies in the Izembek Complex; for example, most surveys that documented Steller's eiders in Izembek, Moffet, and Kinzarof Lagoons and Cold Bay would have lumped all locations into "Izembek Lagoon." Here, in "Status of the Steller's Eider within the Action Area," use of "Izembek Lagoon" refers to the combined Izembek and Moffet Lagoons, the joined waterbodies in this complex that receive highest use by Steller's eiders. However, the entire Izembek Complex appears to be important to supporting Steller's eiders in this region (see especially 4.2.2). Steller's eiders may rely on full access to and use of the Izembek Complex during winter or other times of the year with extreme weather events, in part because Izembek and Kinzarof Lagoons experience opposite prevailing winds and distinct tidal cycles.

4.2.1 Fall Molting Period

Large numbers of Steller's eiders use the Izembek Complex (i.e., primarily Izembek Lagoon but also Kinzarof Lagoon) for their primary remigial molt (Petersen 1981, USFWS 1986, USFWS/Dau 1999, Rosenberg et al. 2014) during August through October (Petersen 1980, Rosenberg et al. 2014, Martin et al. 2015). Studies in the late 1970s noted spatial separation of age classes and sexes during molt, and Izembek Lagoon was deemed the most important molting site for adult female Steller's eiders (Petersen 1981). Izembek Lagoon was also one of the important molting sites for adult male Steller's eiders during this period (Petersen 1980, 1981).

Information on molt migration is limited to one study (Martin et al. 2015) that tracked 13 individuals (7 males, 6 females) from Alaska-breeding grounds to molting areas in 2000 and 2001. Based on this relatively small sample, 7 of the 13 birds (53 percent) marked in Alaska during the breeding season near Utqiaġvik molted at Kuskokwim Shoals, suggesting that Alaska-breeding birds may disproportionately use this molting area over other molting areas. Five of the 13 marked birds (39 percent) used the greater Alaska Peninsula area (including Nelson Lagoon, Izembek Lagoon, Port Moller, and the Seal Islands) during molt, with 1 bird (8 percent) using Izembek Lagoon. The broad distribution of marked birds throughout the wintering range in southwest Alaska suggests that the Alaska-breeding population does not segregate from the Russian-Pacific breeding population in winter.

During 1975 to 2018, individuals counted in the Izembek Complex represented 20 to 34 percent of all Steller's eiders found on the Alaska Peninsula during the fall molting period during (USFWS/Wilson 2019*a*). Historical data provide a high peak count of just over 90,000 and mean peak count of just over 60,000 Steller's eiders using the Izembek Complex (USFWS 1986). Historical numbers of Steller's eiders using the Izembek Complex during fall molt are noticeably greater than contemporary numbers. Long-term data on Steller's eider numbers are available from an annual survey designed to target Pacific brant (*Branta bernicla*). A recent analysis of these data gives an all-year average of 18,592 Steller's eiders present in Izembek Lagoon during the fall molting period (annual estimate ranging from 3,892 to 78,645 during 1976 to 2018), with the most recent 10-year average being 5,866 (annual estimate ranging from 3,892 to 9,742 during 2009 to 2018; (USFWS/Wilson 2019*a*). Assuming Alaska-breeding Steller's eiders comprise approximately 1 percent of the Pacific-wintering population, using the most recent 10-years of data, an average of approximately 59 Steller's eiders (with a range of 39 to 97) from the listed population could use the Izembek Complex for their fall remigial molt. These estimates are based on data collected during September 23 to October 31 each year, and therefore earlier-molting Steller's eider groups (e.g., subadults, non-breeders and failed breeders, and possibly even breeding males) may not be accounted for in these estimates. These data do provide a reasonable estimate for the typical peak period of Steller's eider molt.

For comparison, the number of Steller's eiders that may be using the Izembek Complex during fall molt can also be calculated with data from the most recent Steller's eider-specific fall surveys along the Alaska Peninsula, which counted an average of 50,926 (ranging from 30,407 to 70,320) eiders annually using the Alaska Peninsula and an average of 4,840 (ranging from 2,585 to 7,155) eiders using Izembek Lagoon, during 2012 to 2016 (USFWS/Williams et al. 2016). These surveys found an average of 9.5 percent (between 5.5 and 16.1 percent) of Alaska

Peninsula Steller's eiders used Izembek Lagoon. Assuming Alaska-breeding Steller's eiders comprise approximately 1 percent of the Pacific-wintering population, an average of 48 (ranging from 26 to 72) Steller's eiders from the listed population could use the Izembek Complex for their fall remigial molt. However, these photographic surveys occurred in late August and early September, when successful breeding females would not yet have arrived on their molting grounds. While this survey method provides an estimate of Steller's eiders molting early in the fall period, these totals are likely to underestimate the total number of birds from the Alaska-breeding population that use Izembek Lagoon for molting habitat throughout the fall.

In summary, two different survey methods establish a baseline number of molting eiders in Izembek Complex. An average of 5,866 Steller's eiders were counted from 2008 to 2018 during brant targeted surveys and an average of 4,840 Steller's eiders were counted from 2012 to 2016 during Steller's eider specific surveys in Izembek Lagoon (Table 4). Assuming that 1 percent of the pacific-wintering population is the listed entity, we can take 1 percent of the average Steller's eiders observed during the two different fall surveys to estimate approximately 48 to 59 Steller's eiders (or 12 to 15 percent) of the listed population currently use Izembek Complex for their fall remigial molt. Using data from the Steller's eider specific survey, approximately 9.5 percent of eiders molting on the Alaska Peninsula use Izembek Complex for their fall remigial molt. Although peak counts of Steller's eiders using the Izembek Complex show annual variability, the long-term data show an apparent declining trend in the fall population of Steller's eiders using the Izembek Complex (0.948, 95 percent CI: 0.938-0.958; Figure 18). However, there is no apparent trend in the most recent 10-year period (0.956, 95 percent CI: 0.888 to 1.024; USFWS/Wilson 2019*a*). The reduction in number of eiders observed at Izembek Lagoon in the fall may represent changes in their fall molting distribution (i.e., resulting in lower site fidelity; untested hypothesis in USFWS/Wilson 2019*a*.), or lower survival (Hollmen et al. 2022, Maliguine 2024).

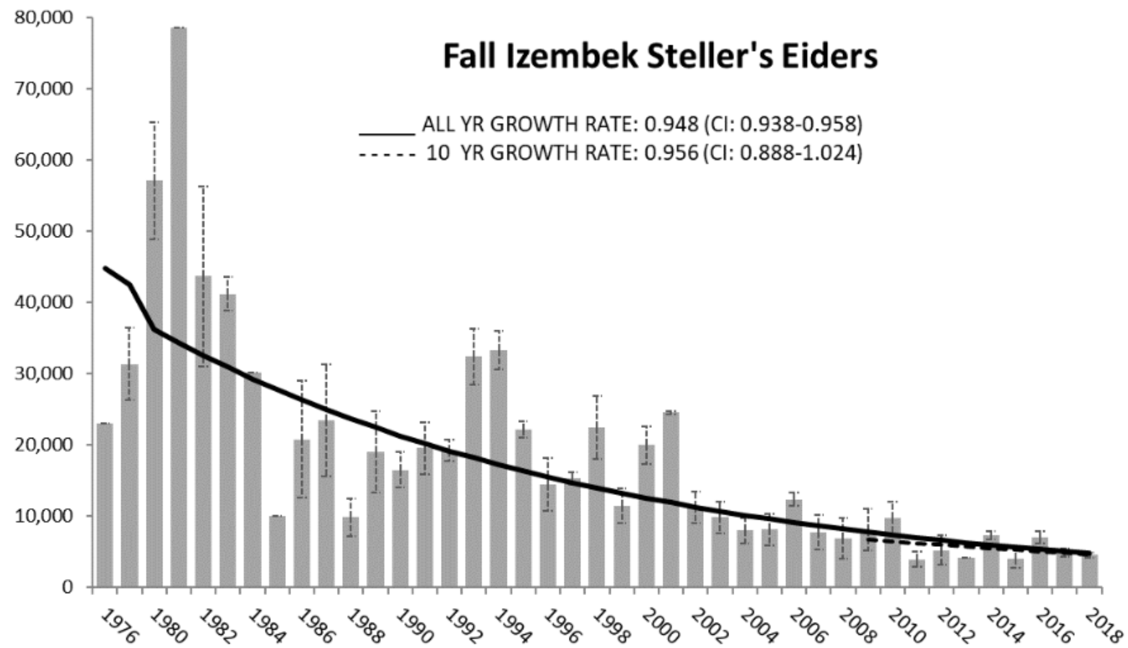


Figure 18. Long-term trend in the number of Steller's eiders present at the Izembek Lagoon complex during the fall molting period from surveys targeting Pacific brant (USFWS/Wilson 2019*a*).

Table 4. Summary of Steller's eider use of the Alaska Peninsula and the Izembek Complex during the fall remigial molt (2012 to 2016 data from USFWS/Williams et al. 2016, 1976-2018 data from USFWS/Wilson 2019*a*).

Survey Focal Species	Survey Location	Survey Years	Minimum Eiders	Maximum Eiders	Average Eiders	Alaska Breeding (1% of Average)	Percent of Listed Population in Izembek (Alaska Breeding/406)	Percent of Eiders Using Izembek relative to Alaska Peninsula (%)
Pacific Brant	Izembek Complex	1976-2018	3,892	78,645	18,592			
Pacific Brant	Izembek Complex	2009-2018	3,892	9,742	5,866	58.66	14.45	
Steller's Eider	Alaska Peninsula	2012-2016	30,407	70,320	50,926	509.26		9.50
Steller's Eider	Izembek Complex	2012-2016	2,585	7,155	4,840	48.4	11.92	

4.2.2 Wintering

Wintering locations provide important foraging and resting habitat; pair bonding and courtship behavior also begins in these locations during late winter and is completed prior to departure to the breeding grounds (Laubhan and Metzner 1999, Flint et al. 2000, Fredrickson 2001, Martin et al. 2015). Steller's eiders are assumed to show strong wintering site fidelity, since they are regularly observed in traditionally used areas and rarely seen outside these areas (Žydelis et al. 2006). The Izembek Complex is one of the major wintering areas for Steller's eiders, with large concentrations in Izembek Lagoon and connected waters but also Kinzarof Lagoon and Cold Bay. A large number of birds that molt in Izembek Lagoon will remain for the winter (i.e., January to April) to continue feeding in the shallow, intertidal, eelgrass-dominated habitats (C. Dau, USFWS, unpublished data); and some individuals that molt at more northerly sites may spend at least a portion of the wintering period in the Izembek Complex (Martin et al. 2015).

Winter distribution of Steller's eiders throughout the Izembek Complex and the greater Alaska Peninsula region is strongly influenced by winter weather conditions and icing conditions in the shallow lagoon system (USFWS/Trust et al. 1997, Laubhan and Metzner 1999). Steller's eider use of Kinzarof Lagoon and Cold Bay increases when surface waters freeze at Izembek Lagoon (as little as 10 percent ice cover); and when Izembek Lagoon's intertidal flats freeze to the bottom, access to these ice-free sites becomes increasingly important for eiders to maintain access to prey resources (Laubhan and Metzner 1999). Use of these deeper water sites declines again in April, during the spring staging period (Laubhan and Metzner 1999), when Izembek Lagoon becomes ice-free. While Steller's eiders are generally described as preferring shallow waters (less than 10 m deep), satellite transmitter data indicates frequent use of deeper waters up to 30 m deep almost exclusively at night during the winter (Martin et al. 2015).

Severe winter weather events have been documented in the area, occurring infrequently over the years (Schneider and Faro 1975, Esslinger 1999, Watts et al. 2010, USFWS/Larned 2012), but causing severe ice conditions that impact local wildlife, including Steller's eiders. In the winter of 2025/2026, heavy and persistent sea ice cover forced most waterbirds (eiders, brant, and other species) out of Izembek Lagoon and into deeper water sites. Kinzarof Lagoon and portions of Cold Bay were also iced over. Weather conditions, potentially combined with other unknown factors, contributed to a large mortality event, with several hundred brant plus unidentifiable carcasses of other species documented (A. Williams, USFWS, pers. comm. 2026*b*). During these extreme conditions, birds remaining in the area relied on open water wherever it occurred, including open leads in the lagoons and open water around the Cold Bay ferry terminal infrastructure (A. Williams, USFWS, pers. comm. 2026*b*). Birds remaining in the area showed signs of exhaustion (A. Williams, USFWS, pers. comm. 2026*b*), and necropsies of a small sample of carcasses indicated no fat reserves (S. Coburn, ADEC, pers. comm. 2026).

The extreme weather event affected other waterbodies in the general area (e.g., the embayment of King Cove) as well as waterbodies along the northern Alaska Peninsula (e.g., Nelson Lagoon). Simultaneously, some of the brant carcasses were confirmed to have had active HPAI infections (USDA Animal and Plant Health Inspection Service 2026). It is unknown how widespread HPAI was in waterfowl in the Izembek Complex during this period. Some birds in better condition may have been able to fight the infection, whereas birds under energetic stress would have had higher mortality risk (Daniels et al. 2025).

Historical numbers of Steller's eiders overwintering at Izembek Lagoon were counted in the tens of thousands (Dau, USFWS, unpublished data). More recent estimates are available from data collected during winter brant surveys, with the most recent six survey years counting 16,735 to 24,726 Steller's eiders in the Izembek Complex (USFWS/Wilson 2019*b*, USFWS/Wilson and Larned 2020, 2021, 2022, 2023, 2024). Winter counts can show high variability due to interannual variability in weather conditions, but the long-term average (1981 to 2024) is 20,100 Steller's eiders wintering in the Izembek Complex (95 percent CI: 17,666 to 24,252); and this estimate appears relatively stable over time (USFWS/Wilson and Larned 2024:202). The average of the 2019 to 2024 Steller's eider February counts was 21,118 eiders (USFWS/Wilson 2019*b* and USFWS/Wilson and Larned 2020, 2021, 2022, 2023, 2024).

Assuming Alaska-breeding Steller's eiders comprise approximately 1 percent of the Pacific-wintering population and using the 95 percent confidence interval from the 1981 to 2024 data, we estimate the number of Alaska-breeding Steller's eiders that could overwinter in the Izembek Complex (and perform important courtship and pair bonding behaviors in this location) is 177 to 243 birds, or approximately 40 to 60 percent of the listed population. Using only the most recent six years (2019 to 2024), we estimate approximately 211 Alaska-breeding eiders or approximately 52 percent of the listed population could overwinter in Izembek complex.

4.2.3 Spring Staging

Numbers of Steller's eiders using the Izembek Complex may increase during spring staging, as birds wintering in more southern areas begin to move north. In 2011, 94 percent of total Steller's eiders observed between the Yukon-Kuskokwim Delta and the southwest tip of the Alaska Peninsula were counted in the Alaska Peninsula region, with 51 percent staging in the vicinity of Cold Bay during the survey period (USFWS/Larned 2012*b*). Historically, the combined number of Steller's eiders aggregating in the Izembek Complex and the greater Cold Bay area during peak staging in April numbered approximately 100,000 (Jones 1965). Spring goose surveys have counted up to 79,000 Steller's eiders at Izembek Lagoon in late April/early May (USFWS/Dau 1999); and in the most recent available dataset, approximately 28,000 and 38,000 Steller's eiders were counted in other waters in the vicinity of Cold Bay (27,500 and 37,000 in the greater Izembek Complex) during April 2012 and April 2011, respectively (USFWS/Larned 2012*b*). The 2011 survey represents a more typical spring with low ice cover in the region and the 2012 survey had a late spring and high sea ice cover, making survey results less reliable (USFWS/Larned 2012*a*, *b*). Overall totals of spring-staging Steller's eiders counted in 2011 in southwest Alaska were close to the 1992 to 2011 average but were but were 35 percent higher than the 2010 estimate and 20 percent higher than the 2012 estimate (USFWS/Larned 2012*b*, *a*).

Numbers of Steller's eiders counted during spring staging are influenced by icing conditions and can be highly variable both within and between seasons (USFWS/Larned 2012*b*), which makes it difficult to estimate how many Steller's eiders might be staging in the Izembek Complex during the spring period. Given that some or all individuals from the Pacific-wintering population that overwinter in the Cold Bay area or locations farther south could stage in the Izembek Complex as they move northward during spring migration, we assume more Steller's eiders could use the Izembek Complex during spring staging than molt in this location.

The two most recent Southwest Alaska surveys in 2011 and 2012 show approximately 50 percent of Steller's eiders using the Izembek Complex for spring staging. The Service counted an average of 81,453 Steller's eiders from 1992 to 2011 during spring surveys in Southwest Alaska. In 2011, the most recent reliable spring count, 73,369 eiders were counted in Southwest Alaska and 37,743 eiders in Izembek Complex (USFWS/Larned 2012b). There are two logical ways to estimate the number of Alaska-breeding Steller's eiders which may be using Izembek Complex for spring staging:

1) We could assume that 1 percent of any given aggregation of Pacific-wintering birds is from the Pacific-wintering population and therefore nearly all the listed population could use the Izembek Complex for spring migration and staging (37,743 x 0.01= 377 eiders). However, the logical problem with this method is that the Alaska-breeding population of eiders is estimated at 406 birds and treating the spring survey data from Southwest Alaska with the 1 percent rule would indicate there are nearly double the known number in the Alaska-breeding population (744 birds in 2011). The 377 eiders is likely an overestimate given that we have no information to support the idea that Alaska-breeding Steller's eiders prefer staging in Izembek Complex. However, it is still a reasonable upper estimate of use throughout the spring staging period.

2) Alternatively, we could assume that Alaska-breeding Steller's eiders use the Izembek Complex in similar proportion to all Pacific-wintering eiders. Since approximately half the eiders counted in spring surveys use Izembek Complex, we assume that half of the Alaska-breeding population use Izembek complex (406 x 0.5 = 203 eiders). While the Service generally assumes 1 percent of any given aggregation of Pacific-wintering birds are Alaska-breeding birds (Hodges and Eldridge 2001), this is a unique example of where we have additional data to make a reasonable alternative assumption.

   We acknowledge that this raises concern regarding the validity of the assumption that Alaska-breeding Steller's eiders make up approximately 1 percent of the Alaska-breeding. This estimate may have shifted in the 25 years since the estimate was made, however we do not have population estimates from the Russian-breeding grounds to support analyses to update the estimated ratio of Russia-breeding to Alaska-breeding birds that comprise the Pacific-wintering population.

Using the combination of these two methods, our best estimate is that between half and nearly all of Alaska-breeding Steller's eiders (between 203 and 377 eiders) use Izembek Complex for spring migration and staging. Steller's eider presence in Izembek Complex is variable throughout the year (Table 5).

Table 5. Estimated number of Alaska-breeding Steller's eiders present in the Izembek Complex during each season, using the most recent datasets available and the logical assumptions explained within sections 4.2.1-4.2.3. Fall surveys occurred August 26 to October 31, winter surveys occurred in February, and spring surveys occur in early to mid-April.

Season	Survey Years	Estimated Steller's Eiders (#)	Alaska Breeding Steller's Eiders (#)	Percent of Listed Population (%)
Fall	2009-2018 [a]	5,866	59	15
	2012-2016[b]	4,840	48	12
Winter	2019-2024[c]	21,118	211	52
Spring	2011[d]	37,743	377	50* - 93
Summer	N/A	May be present in small numbers	May be present in small numbers	May be present in small numbers

[a]USFWS/Wilson 2019*a*
[b]USFWS/Williams et al. 2016
[c]USFWS/Wilson 2019*b* and USFWS/Wilson and Larned 2020, 2021, 2022, 2023, 2024
[d]USFWS/Larned 2012b
*See end of section 4.2.3

4.2.4 Ongoing Activities and Threats in the Action Area

4.2.4.1 Harvest of Steller's Eiders

Steller's eiders and hunters may overlap in the action area during the fall-winter general hunt of waterfowl and during the spring-summer subsistence harvest of migratory birds. Although harvest of Steller's eiders is prohibited, during hunting activities that overlap Steller's eiders in space and time, individuals may be unintentionally targeted and shot. ADF&G subsistence harvest records demonstrate *Somateria* eiders and other sea duck species as well as geese are harvested in Cold Bay and King Cove (ADF&G 2025). Harvest of Steller's eiders has been reported in voluntary surveys completed by some communities within and near the action area (Naves and Schamber 2024).

Quantifying the harvest of Steller's eiders is complex range wide, especially considering that reliability of harvest survey reports are affected by a number of unquantifiable biases (see harvest discussion in (USFWS 2026). However, within the proposed action area the best available data for harvest is that reported by rural hunters and assessed by Naves and Schamber (2024). This is in part due to the differences in use by Steller's eiders between the action area and the North Slope region and the lack of other data sources.

The action area overlaps with the Aleutian Pribilof Islands region where the estimated annual harvest is 18 Steller's eiders per year (Naves and Schamber 2024). This region accounts for 8.9 percent of the total Steller's eider harvest by subsistence hunters in Alaska (18 eiders harvested in Aleutian Pribilof Islands / 202 total eiders harvested in Alaska = 8.9 percent). This estimate does not account for wound loss (i.e., birds struck but not retrieved), which is estimated to occur at a rate of 0.30 of the total reported harvest (Rothe et al. 2015). We anticipate there could be an additional 6 Steller's eiders harvested in this region when we account for wound loss (18 eiders harvested x 0.30 wound loss rate = 5.4 eiders wounded, we round up). When accounting for wound loss, we estimate annual harvest to 24 Steller's eiders in the Aleutian Pribilof Islands region. Assuming 1 percent of these pacific-wintering Steller's eiders are from the Alaska-breeding population, we estimate 0.24 Alaska-breeding Steller's eiders are harvested each year from the Aleutian Pribilof Islands region (or approximately 1 eider every 4 years).

To estimate the baseline inadvertent rate of harvest for Alaska-breeding Steller's eiders in Izembek Lagoon, we assume Cold Bay residents are the primary subsistence hunters in Izembek Lagoon and that the majority of their waterfowl harvest occurs in Izembek Lagoon. We assume this because Izembek Lagoon is a prime waterfowl hunting location and the community of Cold Bay has road access to the lagoon. We used 2010 population data for Cold Bay and the management region as a whole (see Naves and Schamber 2024, Table S1) to estimate the proportion of harvest that occurs in Izembek Lagoon. We divided the population of Cold Bay by the population of the Aleutian Pribilof Islands region to get an estimated current harvest rate of 0.0058 eiders per year in Izembek Lagoon, or approximately one eider every 172 years due to subsistence harvest alone (108 Cold Bay residents / 4,428 Aleutian Pribilof residents[1] equals 0.024; 0.024 x 0.24 annual Steller's eiders harvested in the region equals 0.0058 eiders per year in the action area). This number does not include any harvest that may occur in Izembek Lagoon by other communities accessing the lagoon by boat.

Steller's eider harvest estimates overall are likely biased low in this area. Izembek lagoon is a prime hunting area for avid waterfowl hunters (ADF&G 2026) and guiding services advertise it as "Alaska's #1 Hunting Destination" (Cold Bay Outfitters 2017). There is a large amount of non-subsistence hunting occurring in the area, yet no Steller's eiders were reported as taken during the fall-winter general hunting season from published data from the Harvest Reporting Program (Naves and Schamber 2024). However, outside of formal reporting channels, a small number of Steller's eiders have been reported as shot by commercially guided clients during the fall-winter general hunt at Izembek Lagoon (M. Fosado, USFWS, pers. comm. 2024). Fall sport hunters and rural subsistence hunters participating in the surveys analyzed by Naves and Schamber (2024) might be reluctant to report harvest of a species that cannot be legally hunted. Dau et al. (2000) also suggested that the low recovery rate of bands collected during their 1961-1998 banding study at Izembek Lagoon was likely related to low reporting rates resulting from fear of prosecution. Species identification issues, particularly for female eiders, also makes quantifying the harvest challenging (Naves and Schamber 2024, USFWS 2025c, USFWS 2026).

The best data available on inadvertent eider harvest does not include inadvertent harvest from non-residents. We estimate 22.2 percent of harvest in Izembek Lagoon occurs from subsistence hunting by Cold Bay compared to commercial harvest, based on CUD equivalents (Appendix A). If we assume the rate of inadvertent harvest of Steller's eiders is the same for subsistence and sport hunters, we can estimate total current harvest of Steller's eiders in the action area. We expect the total baseline rate of harvest of Alaska breeding Steller's eider from both subsistence

[1] Note, the Aleutian Pribilofs population number comes from Naves and Schamber 2024 and are based on the U.S. Census Data from 2010, the time period during which their study data is derived. We do not have readily available current data to extrapolate their study based on current populations in the Aleutian Pribilofs Management Region. Thus, we use the U.S. Census Data for Cold Bay during the same time period to approximate the portion of Steller's eider harvest occurring due to subsistence harvest by this community.

and sport hunting in Izembek Lagoon to be approximately 0.026 eiders per year (0.0058 eiders per year from subsistence / 0.222 estimated portion of harvest total harvest). This results in a current estimated harvest of one Alaska-breeding Steller's eider every 38.5 years in Izembek Lagoon.

4.2.4.2 Sport and Subsistence Hunting of Other Waterfowl Species

The fall-winter general hunt for waterfowl, for which Izembek Lagoon is a prime location, overlaps the flightless molt for Steller's eiders. Pacific brant, emperor geese (*Chen canagicus*, when open for hunting by regulation), Canada/cackling geese (*Branta canadensis*/*B. hutchinsii*), and sea ducks are targeted during the general hunt. Commercial hunting operators guide sport hunting clients targeting waterfowl during the fall hunting period in this area. Non-guided sport hunting of waterfowl also occurs in this area during fall, and additional waterfowl harvest by subsistence hunters occurs in fall through spring. Subsistence hunters target similar species as sport hunters. The period open for subsistence hunting of waterfowl overlaps all three periods of the annual cycle when Steller's eiders concentrate in the Izembek Complex.

Waterfowl hunting in the area primarily occurs in Izembek Lagoon, is both land- and boat-based, and mostly occurs nearshore (Stillman et al. 2021). Because land- and boat-based hunting generally occur within a few km of the shore, disturbance of waterfowl from hunting is typically concentrated in the nearshore areas and not as prevalent throughout a majority of Izembek Lagoon (Stillman et al. 2021). Land-based hunting originates from the existing road network, with overland travel on foot, or hunters can rely on ATV travel along the shoreline of Izembek Lagoon. Some targeted hunting of sea ducks and geese occurs offshore within Izembek Lagoon, taking place from boats and from the barrier islands enclosing the lagoon. Human-induced disturbance to waterfowl in Izembek Lagoon has been documented from hunting during fall and spring, with disturbance events occurring more frequently closer to road-based access points (Stillman et al. 2021). The area where waterfowl hunting occurs has expanded beyond the historically hunted locations; areas waterfowl previously used as refugia for resting are now more accessible due to changed hunting methods and means of access (M. Fosado, USFWS pers. Comm. 2025).

During a study of Pacific brant disturbance at Izembek Lagoon from 1985 to 1987, hunting disturbance events were observed at an average rate of 0.06 events per hour (Ward et al. 1994). The disturbance rate was variable across sampling points in the lagoon, with the lowest rate being 0.02 events per hour and the highest rate being 0.14 events per hour. These disturbance rates were observed during years where hunting effort was assessed as approximately 60 percent below the average due to lower hunting bag limits; we therefore estimate hunting activity in a typical year would have resulted in 0.06 to 0.15 disturbance events per hour (Appendix B). Brant responded to hunting disturbance events 65 percent of the time, with 39 percent of events leading to a flight response.

We estimate waterfowl hunting has increased within the Izembek Complex ninefold in the four decades since the Ward et al. 1994 study occurred. Pacific brant banding data indicates a threefold increase in recovery rates through the 1990s to the 2010s (Leach et al. 2017, Leach et al. 2019, Stillman et al. 2021). From the 2010s to 2025, there has been an additional threefold increase in hunting, based on Client Use Days (CUDs; Appendix B). CUDs do not represent non-guided hunts and are assumed to underestimate total commercially supported hunting effort: commercial operators without refuge-issued special use permits rent trucks and hunting equipment to "independent" sport hunters to enable their use of the existing but limited road network to access hunting areas on State and Federal lands (Cold Bay Outfitters 2017). However, these data on CUDs also include hunting activity outside of Steller's eider usage areas and even some entirely outside the Izembek Complex, which may somewhat mute this discrepancy.

Based on increasing trends in commercially guided waterfowl hunting activity since the 1990s, we consider the observed ninefold increase from historical levels to be a reasonable proxy for current waterfowl hunting activity in Izembek Lagoon. Using the data from Ward et al. (1994) and applying this ninefold increase in activity, we estimate current hunting-caused disturbance to waterfowl at Izembek Lagoon currently ranges from 0.54 to 1.35 events per hour (Appendix B). At this rate, we estimate waterfowl presently respond to hunting disturbance for 0.68 to 1.69 minutes per hour, or 1.13 to 2.82 percent of their hourly budget during daytime hours (Table 6). This estimate is based on best available information but does not capture some additional level of hunting activity that targets non-waterfowl species (e.g., large game hunting); it is unclear the extent to which hunting of non-waterfowl taxa would overlap with areas used by Steller's eiders, whereas we are confident most waterfowl hunting would overlap their areas of use. For the purposes of understanding the disturbance effects of hunting on Steller's eiders, we consider subsistence harvest activities to have similar effects to fall sport hunting.

The disturbance estimates represent the average disturbance from all study areas in Izembek Lagoon (Table 6; Ward et al. 1994). A total of 8 study areas were chosen based on abundance of brant, accessibility to observers, and presence of elevated shore that permitted an unobstructed view of black brant over large areas (See Figure B-1 in Appendix B). Beyond these areas, we do not have data about disturbance rates in Izembek Lagoon. It is likely the study area encompasses zones where human disturbance is most intense due to site selection for abundance of brant (which is also where hunting is most likely to occur) and existing road access. The disturbance estimates are derived from averages (Table 6) given that disturbance rates are variable across the study area; beyond the study area it is likely that disturbance rates are lower. This can be visualized using the parameters from recent black brant modelling (Stillman et al. 2021). The model applied disturbance rates to 1 km^2 grid cells, with a threefold increase in disturbance from historic levels (Figure 19; Stillman et al. 2021). The Stillman paper included estimates for Kinzarof Lagoon that are not presented in the original study and are not considered in this biological opinion. Regardless, the parameters can be used to visualize the areas where disturbance estimates exist and areas where we lack disturbance data (Figure 19).

Table 6. Estimated flight time, disturbance time, and percent of daytime hourly budget spent responding to hunting disturbances in Izembek Complex. Data derived from Ward et al. 1994 per the methods in Appendix B.

Hunting Disturbance	**Flight Time Estimates (minutes/hour)**		**Disturbance Time Estimates (minutes/hour)**		**Percent of Daytime Hourly Budget Responding to Disturbance (%)**	
	Lower	Upper	Lower	Upper	Lower	Upper
Historic	0.03	0.08	0.08	0.19	0.13	0.31
Environmental Baseline	0.30	0.76	0.68	1.69	1.13	2.82

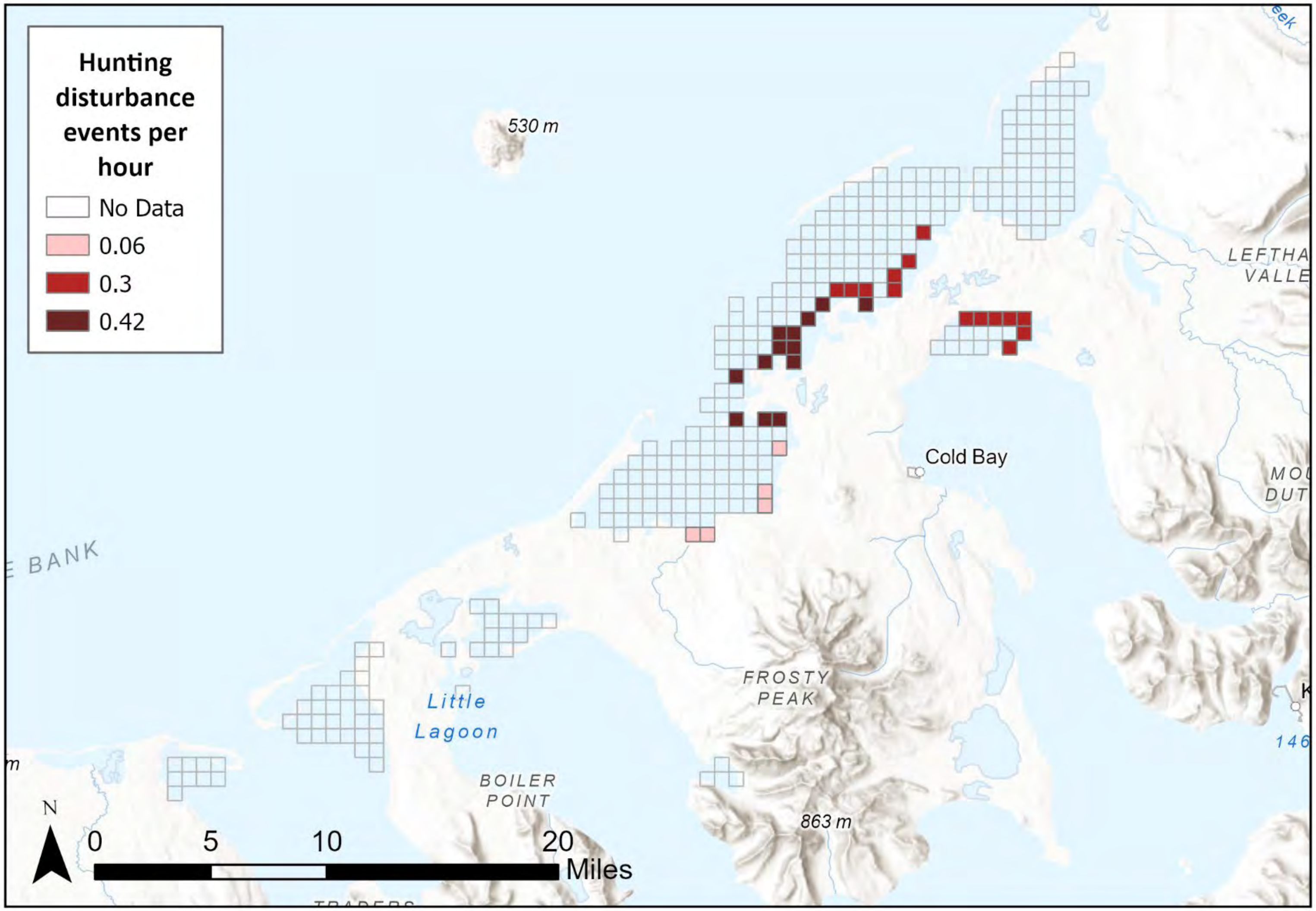


Figure 19. Spatial distribution of hunting disturbance parameters from Stillman et al 2021. Disturbance rates are based on data from Ward et al. 1994 and personal communications with Ward. The data presented represents a threefold increase in hunting activity from historically collected data (Stillman et al. 2021).

4.2.4.3 Marine Vessel Activity and Fisheries

During a study at Izembek Lagoon in the 1980s, vessel activity that led to waterfowl disturbance occurred at a rate of 0.02 to 0.05 events per hour (based on Ward et al. 1994 and following our assumptions in 4.2.4.2 related to low and high years of activity, assuming most observed vessel activity was related to hunting). Brant responded to boating disturbance events 89 percent of the time, with 75 percent of events leading to a flight response. Vessel-caused disturbance was measured separately from hunter-caused disturbance in the Ward et al. (1994) brant study, and we assume was a measurement of reactions to vessel movement and presence (as opposed to humans and gunshots). However, this brant study may not be representative of year-round vessel activity in Izembek Lagoon and the corresponding rates of disturbance to waterfowl. This study took place only during the legal hunting season and therefore measured vessel activity during only a portion of the year (September to November). Vessel activity could be less outside the legal hunting period or could be the same or higher as activities shift throughout the year. For example, we expect commercial and subsistence fishing activities and their associated vessel traffic in Izembek Lagoon are not represented in this dataset. We do not have a way to directly measure current fishing activity or other vessel uses in this location. Therefore, the information provided by the brant study serves as the best available proxy to measure current baseline vessel activity in Izembek Lagoon overall.

Hunters access Izembek Lagoon for waterfowl hunting by boat and overland, and we assume equal access between these two modes. Any increase in hunting activity will result in an equal proportional increase in both land-based and boat-based hunting activities. Therefore, we consider the estimated ninefold increase in waterfowl hunting from historic levels to be a reasonable proxy for current vessel-based activity in Izembek Lagoon, based on the increase in commercially guided activity (Appendix B). We estimate vessel-caused disturbance to waterfowl at Izembek Lagoon currently ranges from 0.18 to 0.45 events per hour. At this rate, we estimate waterfowl currently respond to vessel disturbance for 0.56 to 1.39 minutes per hour, or 0.93 to 2.32 percent of their hourly budget during daytime hours (Table 7).

Table 7. Estimated flight time, disturbance time, and percent of daytime hourly budget spent responding to vessel disturbances in Izembek Complex. Data derived from Ward et al. 1994 per the methods in Appendix B.

Boating Disturbance	Flight Time Estimates (minutes/hour)		Disturbance Time Estimates (minutes/hour)		Percent of Daytime Hourly Budget Responding to Disturbance (%)	
	Lower	Upper	Lower	Upper	Lower	Upper
Historic	0.04	0.10	0.06	0.15	0.10	0.26
Environmental Baseline	0.37	0.92	0.56	1.39	0.93	2.32

The disturbance estimates are derived from averages (Table 7) given that disturbance rates are variable across the study area; beyond the study area it is likely that disturbance rates are lower. As in 4.2.4.2 Sport and Subsistence Hunting of Other Waterfowl Species, this can be visualized using the parameters from recent black brant modelling (Stillman et al. 2021), acknowledging the same limitations and assumptions (Figure 20).

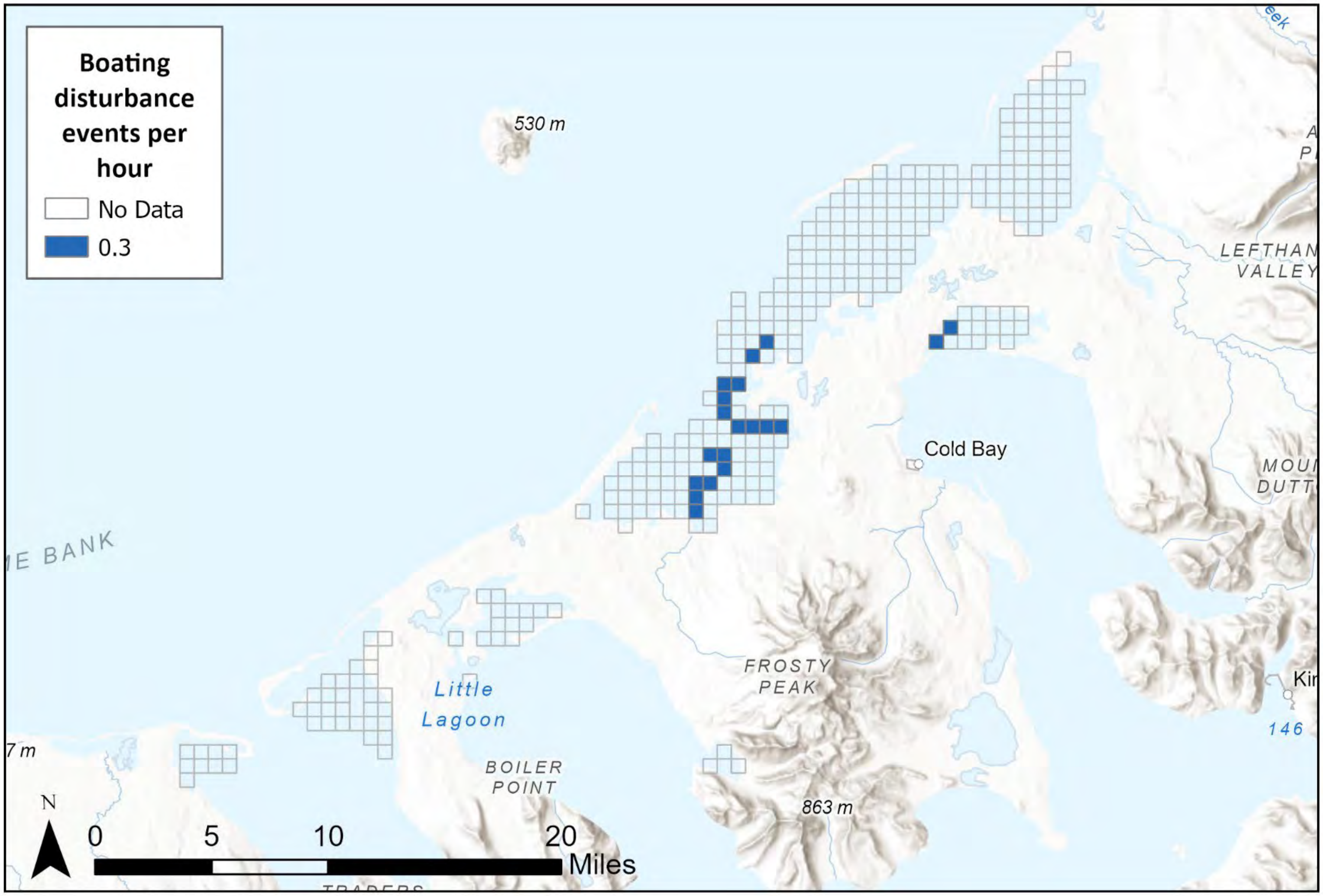


Figure 20. Spatial distribution of hunting disturbance parameters from Stillman et al 2021. Disturbance rates are based on data from Ward et al. 1994 and personal communications with Ward. The data presented represents a threefold increase in hunting activity from historically collected data (Stillman et al. 2021).

The Bristol Bay coastline of the Alaska Peninsula includes several small communities whose population totals approximately 300 people (USCB 2020*c*). The human population along the southern Alaska Peninsula is concentrated in the communities of King Cove and Sand Point, with approximately 757 residents and approximately 578 residents, respectively (USCB 2020*d*). Commercial fishing is the primary economic activity in the region (see section 4.1.6). Incidental fisheries bycatch is a known threat to Steller's eiders (see sections 3.1.4.6). Bycatch risk varies by gear type, with the most dangerous gear type for Steller's eiders being gillnets like those used in the salmon gillnet fishery in Alaska (Dietrich et al. 2025). Bycatch risk increases in proportion to fishing effort and numbers of eiders overlapping in space and time.

Drift and set gillnet fishing both occur in fisheries management areas overlapping the action area (see section 4.1.6), but data are not available to quantify the risk of bycatch to Steller's eiders in relation to fishing effort. Because we know Steller's eiders are vulnerable to bycatch (see section 3.1.4.6) and we expect gillnet fishing and Steller's eiders overlap in the action area, a lack of reports of Steller's eiders being incidentally caught in gillnets may be a product, at least in part, of a lack of dedicated observers to report on bycatch. Most documented interactions with Steller's eiders are self-reported, and many fisher persons do not self-report for various reasons. Bycatch information overall appears to be especially limited for the Alaska Peninsula compared to other areas of Alaska; for example, the South Unimak fishery may have been monitored for bycatch only during 1990 (Dietrich et al. 2025). We assume rate of Steller's eider bycatch is similar to bycatch rates for other *Anatidae* (i.e., diving duck) species. *Anatidae* species accounted for up to 14 percent of bird bycatch in the Alaska salmon gillnet fishery during 1990 to 2013 (Dietrich et al. 2025). Therefore, some number of Steller's eiders may be injured or killed by fishing operations each year, although we cannot estimate the current rate of Steller's eider bycatch within the action area.

4.2.4.4 Collisions with Vessels

Steller's eiders have a high risk of collision with marine- and land-based infrastructure because of their tendency to fly low and fast over the water (Day et al. 2004). Although typically we would expect only a few Steller's eiders to be impacted during any one event, collisions can result in injury and mortality of large numbers of Steller's eiders at once. Over 150 Steller's eiders were reported to have collided with the *M/V* Northern Endeavor in December 1980 in False Pass, an area near the Izembek Complex, when the fishing vessel's crab lights were illuminated on a stormy night (USFWS, Southern Alaska Field Office, unpublished data). In a land-based event in the Cold Bay area in December 1983, 38 Steller's eiders were killed by a radar screen at the Distant Early Warning Line Site (USFWS, Southern Alaska Fish and Wildlife Field Office, unpublished data).

Other marine vessel interactions that have led to collisions have been documented within Area M, the fisheries management area overlapping the action area, including locations near the action area (Table 8). In 2020, collision with three Steller's eiders and take of one (after, assumed to be an Alaska-breeding Steller's eider) was reported by a fishing vessel operating in Bristol Bay, transiting at night along the Alaska Peninsula, near Cape Krenitzen to the north of False Pass (NMFS 2020). Two additional reports with unknown locations are included in Table 8 because they could have overlapped the action area. Vessels operating in Steller's eider habitats also run the risk of striking eiders with the boat propeller or hull, causing injury or death. These incidents would add to the overall picture of mortality of Steller's eiders and other marine birds depicted in Table 8, but they largely go unobserved.

We can estimate Steller's eider collisions rates multiple ways using the historic vessel strike data from the region (Table 8):

1. Our lower estimated eider collision rate is 0.24 Steller's eiders per year. To calculate the lower estimate, we use only Steller's eiders collisions with marine vessels and we exclude the atypical event in 1980 when approximately 150 Steller's eiders collided with a crabbing vessel at night when the lights were on. This is a reasonable lower estimate reflecting high uptake of mariners utilizing best practices for minimizing bird-vessel strikes[2].

   7 Steller's eiders / 29 years = 0.24 eiders per year

2. Our upper estimated eider collision rate is 4.03 Steller's eiders per year. To calculate the upper estimate, we use all available collision data with any eider (not just Steller's eiders) in the region. We also include the atypical event when 150 Steller's eiders struck a single vessel. This is a reasonable upper estimate because bird collisions with vessels are often unreported and atypical events involving large numbers of birds do occur.

   [7 Steller's eiders + 150 Steller's eiders (atypical event) + 4 other eiders] / 40 years = 4.03 eiders per year

Therefore, we estimate between 0.24 and 4.03 eiders per year collide with vessels in the vicinity of the Alaska Peninsula. When mortality of a Steller's eider occurs within areas where the Alaska-breeding and Pacific Russia-breeding populations mix, such as Izembek Lagoon, we recognize any individual Steller's eider could belong to the Alaska-breeding population. Through abundance-based probability, most birds injured or killed by vessel strike in Izembek Lagoon would belong to the Pacific Russia-breeding population. When we use the estimate that 1 percent of these eiders are from the Alaska-breeding population, our baseline collision risk for Alaska-breeding eiders in the project area is extremely low (0.0024 to 0.04). The estimated collision frequency is one Alaska-breeding eider every 25 to 417 years.

Therefore, based on best available data, we expect collision risk to individual Steller's from vessels is presently very low in and near the action area. However, the reported collisions in Table 8 are not comprehensive of all injury and mortality that likely resulted to Steller's eiders or proxy species from collisions with vessels and infrastructure. Detection of collision-injured or -killed birds depends on human presence in the area (Rabie et al. 2024), willingness to report, and other factors such as carcass persistence (Borner et al. 2017). We assume the lack of reporting means our estimate of risk to any individual Steller's eider is low.

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[2] https://www.fws.gov/service/technical-assistance-prevent-bird-vessel-strike-alaska-marine-environment

Table 8. Reported interactions between marine vessels and Steller's eiders or any eider species, which resulted in collisions in waters near the southern end of the Alaska Peninsula.

Date	Vessel Type	Number by species	Location	Notes
Steller's Eiders				
1980 Dec.	Collision with fishing vessel	Estimated 150 Steller's eiders	False Pass (North side)	Crab lights illuminated, stormy night
1991 Feb.	Collision with State Protection Patrol vessel	2 Steller's eiders	Unknown	Vessel lights illuminated
1997 Feb.	Collision with marine vessel	2 Steller's eiders	Unknown	**One bird struck vessel on Feb. 14, second bird struck vessel on Feb. 15.
2020 March	Collision with commercial fishing vessel	3 Steller's eiders, 2 recovered and released	Near False Pass	Occurred while vessel was participating in the pollock fishery
Other Eiders				
2000 Nov.	Collision with marine vessel	1 common eider	Unknown	On deck with a gash in chest. Rough weather the night before
2001 Feb.	Collision with marine vessel	2 King eider	Unknown	Night, male and female found dead on deck, collision obviously occurred
2003 Feb.	Collision with marine vessel	1 King eider	Unknown	Adak vessel observer on roof, crew says bird has been there for a week

4.2.4.5 Collisions with Vertical Structures

As stated above, Steller's eiders have a high risk of collision with marine- and land-based infrastructure because of their tendency to fly low and fast over the water (Day et al. 2004). Although typically we would expect only a few Steller's eiders to be impacted during any one event, collisions can result in injury and mortality of large numbers of Steller's eiders at once. There have been multiple reports of collisions by Steller's eider (n = 44 birds total) and other sea ducks and marine-dependent goose species (n = 165+ birds total) with immobile vertical structures near the action area (Table 9,Table 8; USFWS unpubl. data). These reports have included collisions with buildings, towers, antennae, and the rigging of immobile vessels.

We can estimate Steller's eider collision rates multiple ways using the historic vessel strike data from the region (Table 9):

1. Our lower estimated eider collision rate is 0.32 Steller's eiders per year. To calculate the lower estimate, we use only Steller's eider collisions with infrastructure, and we exclude the atypical event in 1983 when 38 Steller's eiders collided with a military radar screen. This is a reasonable lower estimate because most military radar screens of this type have been deactivated.

   6 Steller's eider / 19 years = 0.32 eiders per year

2. Our upper estimated eider collision rate is 2.55 Steller's eiders per year. To calculate the upper estimate, we use all available collision data (constrained to the reporting period of Steller's eider collisions) involving any eider species (not just Steller's eiders) in the region. We also include the atypical event when 38 Steller's eiders collided with military infrastructure. This is a reasonable upper estimate because bird collisions with infrastructure are often unreported or undetected, and atypical events involving large numbers of birds do occur.

   [6 Steller's eiders + 38 Steller's eiders (atypical event) + 7 other eiders] / 20 years = 2.55 eiders per year

Therefore, we estimate between 0.32 and 2.55 eiders per year collide with vertical structures in the vicinity of the Alaska Peninsula. When mortality of Steller's eider occurs within areas where the Alaska-breeding and Pacific Russia-breeding populations mix, such as Izembek Lagoon, we recognize any individual Steller's eider could belong to the Alaska-breeding population. Through abundance-based probability, most birds injured or killed by vessel strike in Izembek Lagoon would belong to the Pacific Russia-breeding population. When we use the estimate that 1 percent of these eiders are from the Alaska-breeding population, our baseline collision risk for Alaska-breeding eiders in the project area is extremely low (0.0032 to 0.026 Alaska-breeding eiders per year). The estimated collision frequency is one Alaska-breeding eider every 39 to 312 years.

4.3 Status of Designated Critical Habitat for Steller's Eider within the Action Area

The Izembek Lagoon critical habitat unit includes all waters of Izembek Lagoon, Moffett Lagoon, Applegate Cove, and Norma Bay, and waters 0.25 mi (400 m) offshore of the Kudiakof Islands and adjacent mainland **(**Figure 21).

The shallow, protected waters of this critical habitat unit are noted as especially important to Steller's eiders during their complete flight feather molt (Petersen 1981, Laubhan and Metzner 1999). Izembek Lagoon is one of the traditional, primary molting areas for the species (Petersen 1981, USFWS/Wilk et al. 1986, Rosenberg et al. 2014) and continues to be used by large numbers of Steller's eiders (USFWS/Wilson 2019*a*). The Izembek Lagoon critical habitat unit also provides important wintering and spring staging habitat for Steller's eiders.

Table 9. Reported strikes with terrestrial infrastructure or immobile vessels near the action area.

Date	Species	Number	Description
Steller's eiders reported colliding with structures on land			
4/5/1975	Steller's Eider	1	Adult male struck wire at State Shop
12/5/1982	Steller's Eider	1	Adult male struck FAA antenna at airport
12/5/1982	Steller's Eider	2	Adult females struck Pen Hair hanger lights
12/30/1983	Steller's Eider	38	Killed by radar screen at Distant Early Warning Line Site
2/6/1992	Steller's Eider	1	Struck NWS balloon launch building
12/6/1994	Steller's Eider	1	Struck N. side of MAR radar dome
Other sea duck and marine goose species reported colliding with structures on land			
1/3/1949	King Eider	1	Adult male hit building at airport
3/26/1962	King Eider	6	Strike at beacon tower
2/28/1963	King Eider	1	Adult male strike on Volcano Club building
10/26/1976	Brant	150	King Cove-Struck ship rigging and cannery
10/26/1976	Emperor Goose	unk.	King Cove-Struck ship rigging and cannery
12/7/1981	King Eider	1	Unknown collision location
1/20/1983	King Eider	2	Adult male & female hit FWS hanger
3/8/1984	King Eider	1	Adult male struck antenna at GP USAF Site
4/12/1993	King Eider	1	Collision with FSS building antenna
1/9/1994	King Eider	1	Collision with FSS building antenna
3/29/1995	King Eider	1	Russell Creek Hatchery

The geographic location of this unit contributes to its importance for spring staging: located on the southwestern end of the Alaska Peninsula, Izembek Lagoon is ice-free earlier than lagoons and embayments situated on the central and northern Alaska Peninsula and more northern coastlines; the north-facing aspect of Izembek Lagoon also means it is better-sheltered from Bering Sea storms than are south-facing lagoons elsewhere along Bristol Bay and the coastline of western Alaska (King and Dau 1981*a*).

For the Izembek Lagoon critical habitat unit, the PCEs/PBFs essential to conservation of the species include 1) marine waters up to 30 ft (9 m) deep and the underlying substrate, 2) the associated invertebrate fauna in the water column, 3) the underlying marine benthic community, and 4) eelgrass beds and associated flora and fauna. Eelgrass beds are found throughout the lagoon (Figure 22) and support a rich and diverse food supply for Steller's eiders (Metzner 1993). The Izembek Complex supports approximately 76,603 ac (31,000 ha) of eelgrass, with the majority (approximately 42,008 ac [17,000 ha]) in Izembek Lagoon (Hogrefe et al. 2014). Spatial extent of eelgrass beds in Izembek Lagoon remained relatively unchanged during 1978 to 2006 (Ward et al. 2022), while over the period 2006 to 2020 there was a net loss in spatial extent of eelgrass approximately 10 mi^2 (25 km^2) of eelgrass (Douglas et al. 2025). However, the eelgrass beds of Izembek Lagoon remain important, and this is the only location in the Bering Sea where eelgrass grows in both subtidal and intertidal locations (Phillips et al. 1983). Thus, the eelgrass-associated macroinvertebrate community on which Steller's eiders rely are available at varying depths during both high and low tides (Laubhan and Metzner 1999). While in most locations, Steller's eiders primarily forage at low tide for increased access to prey (Petersen 1981), they are able to forage at all tidal cycles in the Izembek Lagoon critical habitat unit (Laubhan and Metzner 1999).

The diet of Steller's eiders foraging in Izembek Lagoon includes diverse taxa belonging to four main invertebrate groups: *Crustacea*, *Bivalvia*, *Gastropoda*, and *Polychaeta* (Metzner 1993). There is some evidence this benthic community might be shifting through time, from a bivalve-dominated to polychaete-dominated community (Maliguine et al. 2025). In a recent study comparing benthic invertebrate samples in Izembek Lagoon in two sample years (2019 and 1998), the occurrence of bivalves and gastropods – prey items preferentially used by molting eiders – did not appear to have changed significantly. However, there was a significant reduction in total biomass of bivalves and crustaceans, and the mean size of bivalves and gastropods was also significantly smaller, in 2019 compared to 1998. These data suggest Izembek Lagoon might provide less optimal foraging conditions for Steller's eiders, particularly during molt, than in the past (Maliguine et al. 2025). As a result, eiders may experience reduced energetics, body condition, or survival; they may also, instead, redistribute to more favorable foraging locations. While Izembek Lagoon was previously found to be one of the most important molting locations for Steller's eiders (Peterson 1981), Nelson Lagoon, further northeast on the Alaska Peninsula, is currently considered to be the most important area for molting (USFWS/Williams et al. 2016), suggesting some redistribution has occurred.

Despite apparent change, the Izembek Lagoon critical habitat unit continues to host large numbers of Steller's eiders during the fall through spring months. The final rule designating critical habitat for Steller's eider (50 CFR Part 17) states areas essential to species' recovery are those used regularly by greater than 5,000 Steller's eiders and occasionally used by greater than 10,000 Steller's eiders, where use by individuals from the Alaska-breeding population has been documented. An estimated 6,000 to 24,000 Steller's eiders might currently use Izembek Lagoon during the molting period, an estimated 17,666 to 24,252 Steller's eiders might winter here, and an estimated 41,000 Steller's eiders could use the Izembek Complex during spring migration and staging. Based on best available data from satellite transmitter-tagged individuals and band recoveries, some of these birds would be Alaska-breeding Steller's eiders. Therefore, despite a reduction since the 1970s in the number of birds using Izembek Lagoon (see 4.2), and despite evidence of some ecological change in the eelgrass community in this critical habitat unit, Izembek Lagoon continues to meet the criteria laid forth.

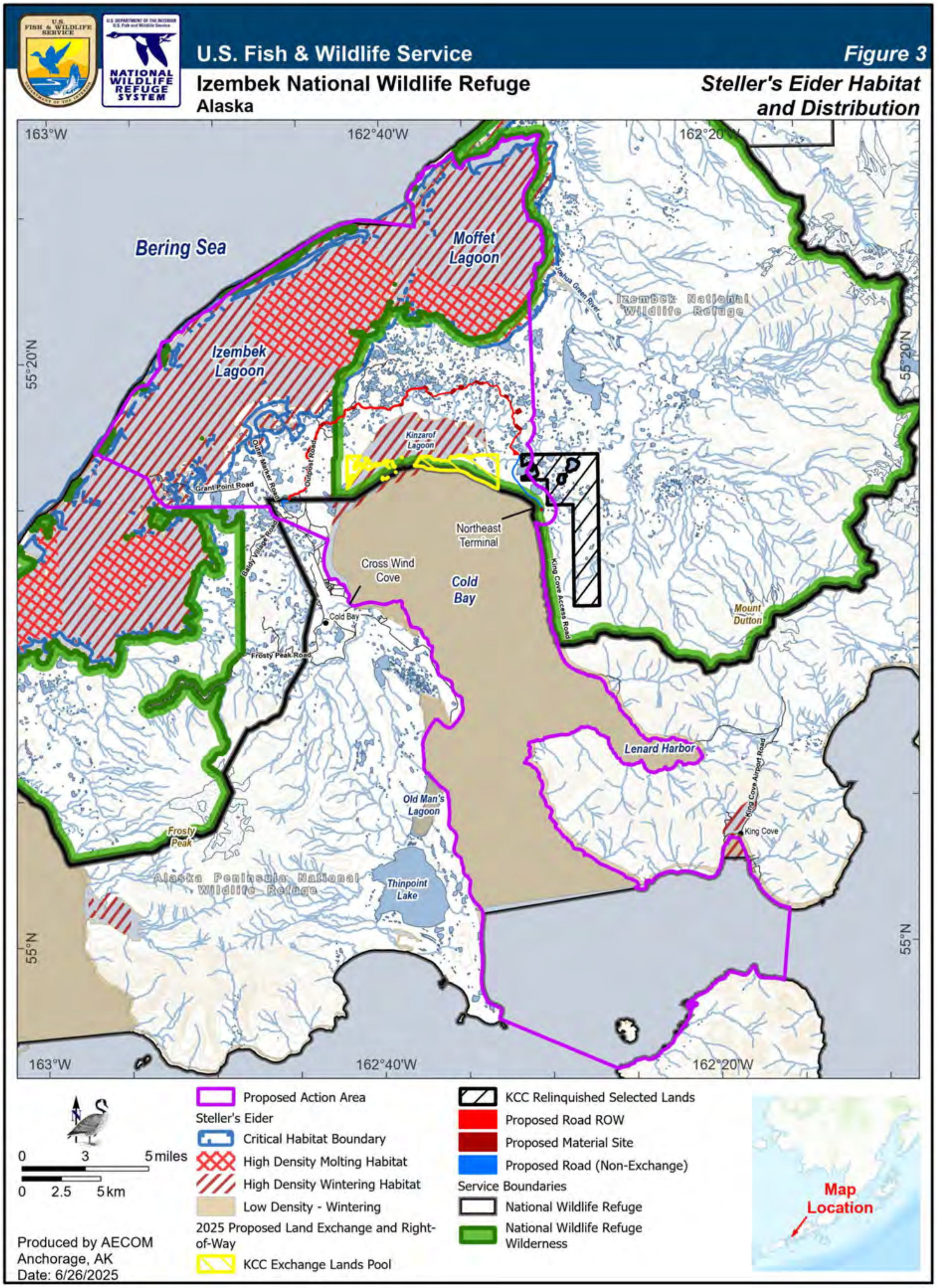

Figure 21. Status of Designated Critical Habitat for Steller's Eider within the Action Area.

4.3.1 Ongoing Activities Affecting Steller's Eider Critical Habitat

Past and ongoing impacts that modify and reduce the quality of PCEs to provide habitat and prey include fishing, hunting, ATVs and trails, contamination, and marine vessels (e.g., skiffs, fishing vessels, and inflatable boats) within Izembek Lagoon. Under State general permits, users are allowed to use certain motorized vessels (e.g., skiffs, fishing vessels, and inflatable boats) within Izembek Lagoon. ATVs, marine motors, and fishing gear can cause mechanical destruction of eelgrass (e.g., from outboard motors cutting blades) and increased sedimentation. Sedimentation and turbidity impact marine waters and marine plants such as eelgrass through decreasing sunlight or physical influence of particulate matter (Longstaff and Dennison 1999, Gorgula and Connell 2004, Watanabe et al. 2016, Picard et al. 2022). Benthic communities, including invertebrate fauna that are important in Steller's eider diet, may experience reduced growth rates and reproductive success in more toxic waters and sediments.

Benthic communities can be sensitive to pollution, sedimentation, and turbidity. Pollution from non-point and point sources including sewage, seafood waste disposal, and coastal runoff may contribute to degradation of marine waters, the benthic substrate, and marine plants. For example, high sedimentation from coastal run-off may bury flora and fauna. In addition, there are ongoing impacts of sedimentation from military roads, motorized trails, and marine vessel use in shallow water.

Past military use has contributed to various contaminants in the area. One example is the White Alice Communication Site, near Grant Point, along the nearshore of Izembek Lagoon (Hazard ID: 2826; ADEC 2025). This site is associated with previous Air Force activity. The structure was demolished between 1987 to 1988, but diesel range organics detected at the site remained above ADEC cleanup levels until 2006. According to ADEC, multiple active contaminated sites remain along the coast of community of Cold Bay, two of which are related to past military use. These contaminants include a hydrocarbon seep and diesel range organics. Preliminary environmental site assessments of the proposed Refuge and KCC exchange lands were conducted in 2025, documenting no recognized environmental conditions (ChemTrack Alaska 2025); however, this assessment did not include on-site assessments and recommended further evaluation of the formerly used defense site areas on the Refuge lands to be transferred to KCC, specifically the need for a survey for unexploded ordnance, prior to ground disturbance.

4.4 Status of the Southwest DPS of Northern Sea Otters within the Action Area

The action area includes the isthmus of land situated between the Bristol Bay MU and the South Alaska Peninsula MU (Figure 23). The Bristol Bay MU to the north side of the action area includes sea otters within Izembek Lagoon. The south side of the action area, near Kinzarof Lagoon, is within the South Alaska Peninsula MU.

4.4.1 Management Units

4.4.1.1 Bristol Bay MU

The 1990s population decline in Bristol Bay was significant, although less severe than those of the South Alaska Peninsula. Results from a survey in 2000 indicated declines of 27 to 49 percent, compared with estimates from 1986 when Bristol Bay had an estimated 6,474 to 9,215 otters (Burn and Doroff 2005). Overall populations in the Bristol Bay MU showed evidence of recovery during the period 2000 and 2016. The 2016 survey estimated total sea otter abundance at 9,733 sea otters, up from 4,728 in 2000 (Brueggeman et al. 1988, Burn and Doroff 2005). The 2016 density estimate of 2.12 otters/mi^2 (1 otter/ha, 0.82 otter/km^2) indicates a moderate population size (Beatty et al. 2021).

Sea otters usually have small home ranges and are restricted to nearshore waters, but the shallow waters of the Bering Sea continental shelf allow otters on the northern side of the Alaska Peninsula to be more mobile and pelagic in their behavior, and they range up to 30 mi (50 km) offshore (Kenyon and King 1965, Schneider 1976). Little is known about the movements of these otters, but there appears to be seasonal changes in sea otter distribution at Port Moller-Herendeen Bay and at Izembek Lagoon (USFWS 2004*a*).

4.4.1.2 South Alaska Peninsula MU

The South Alaska Peninsula MU experienced drastic sea otter declines in the 1990s and currently contains relatively few sea otters (Beatty et al. 2021). Population estimates in 1986 ranged from 13,900 to 17,500 otters (Brueggeman et al. 1988, Burn and Doroff 2005), but only 1,005 otters were estimated in 2001 (Burn and Doroff 2005). The most recent surveys in 2016 estimated 546 otters with a density of 0.16 otters/mi^2 (0.06 otter/ha, 0.06 otter/km^2) which indicates a relatively low population size (Beatty et al. 2021). Differences between the 2001 and 2016 estimates may be due to different survey and analysis techniques, but the decrease after 1986 is too large to be attributed to anything other than a substantial population decline (USFWS 2020). The consistently low numbers indicate the population has not recovered from the declines of the 1990s that led to listing under the ESA.

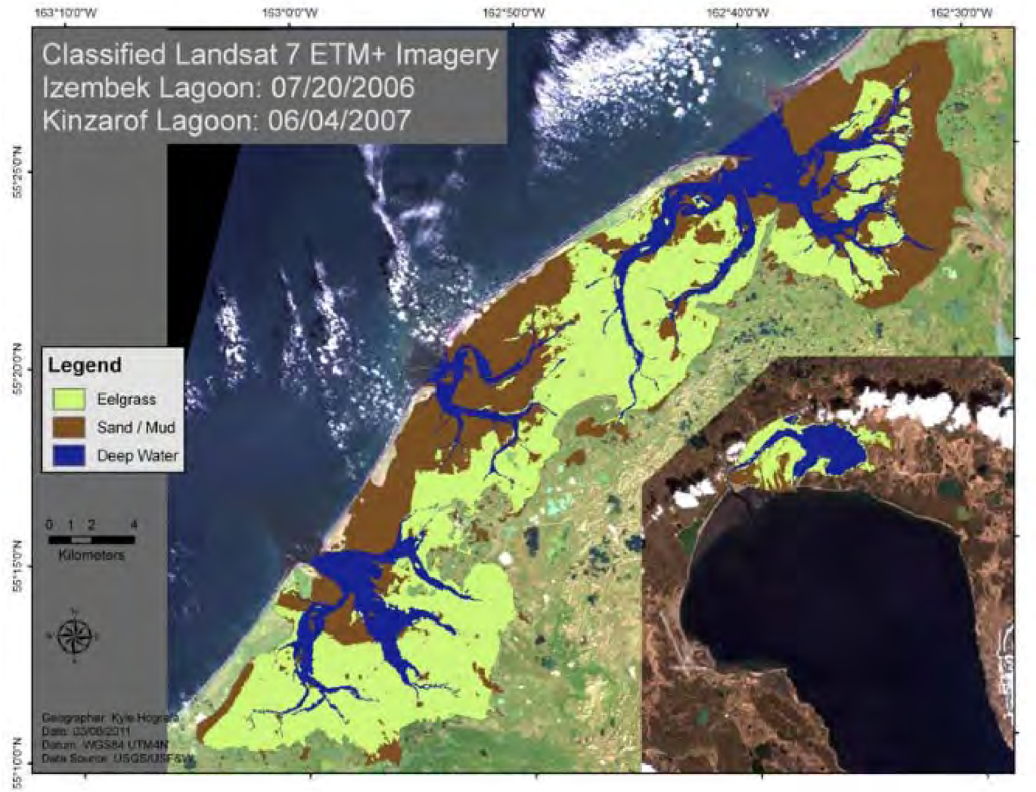

Figure 22. Landsat imagery showing mapped distribution of eelgrass at Izembek Lagoon and Kinzarof Lagoon, Alaska, during 2007 to 2010. From Ward et al. (2002).

Figure 23. Action area situated between the Bristol Bay MU and the South Alaska Peninsula MU of the southwest DPS sea otters.

4.4.2 Habitat Use in the Action Area

Izembek Lagoon, Kinzarof Lagoon, and Cold Bay provide important nearshore habitat for sea otters. Nearshore habitat provides shelter from predators, protection from storms, and access to prey (USFWS 2023*a*). Izembek Lagoon supports a high proportion of mothers with young and may provide important natal habitat for sea otters (USFWS 2004*a*). Kelp is used by mother sea otters to anchor pups while the mother dives for prey. Pups on water float but may be easy targets for eagles, pup fur has been found in eagle nests near coastal areas (Rechsteiner et al. 2018). Seagrass and kelp in the lagoons provide habitat for prey species. The helmet crab (*Telmessus cheiragonus*), an important food source for otters, is abundant in Izembek Lagoon (Sowl et al. 2021). Potential sea otter habitat in Izembek Lagoon is extensive in the shallow water, soft sediment shelf that extends offshore approximately 13 mi (20.9 km) to Amak Island (Doroff and Roy 1999). During an aerial survey in August 1999, it was estimated 615 sea otters occupied Izembek Lagoon (Doroff and Roy 1999). Sea otters are also counted incidental to spring and fall waterfowl surveys in southwestern Alaska, and the maximum number of sea otters counted in Izembek at one time was 1,070 (unpubl. data, Izembek NWR).

Upper Cold Bay and Kinzarof Lagoon are high-density northern sea otter areas with concentrations highest near the entrance to Kinzarof Lagoon (USACE 2003). Nearly half the regional population (False Pass to Seal Cape) uses these areas. Sand and gravel islands and spits near the entrance to Kinzarof Lagoon provide haulouts for up to 200 northern sea otters at a time during the ice-free part of the year (USACE 2003), although otters use the area year-round. This is an important foraging habitat for northern sea otters, and one survey found that *Telmessus* crab was the most common macro-invertebrate surveyed in Kinzarof Lagoon and were more common than in Izembek. Gastropods and *Caprella* shrimp were also found but mussels were absent (Ward et al. 2022). Weather, breeding, and food availability are primary determinants of seasonal occurrence and behavior of sea otters using the Cold Bay–Kinzarof Lagoon area. Kinzarof Lagoon may also be an important haven for killer whale predation avoidance (USACE 2003).

Sea otters tolerate severe ice and weather conditions if they have access to open water to forage. Their dense fur provides insulation from cold waters. Numerous sea otters use Izembek Lagoon during the winter, and a large number of these otters haul out on the shore ice, ice floes, or the barrier islands of the lagoon (USFWS 2004*a*). During extreme cold weather events, however, rapid ice formation may prevent sea otters from accessing open water to forage, resulting in substantial mortality and behavioral changes (Schneider and Faro 1975). Periodically, sea otters have become stranded or entrapped in ice-free pools surrounded by pack ice or have attempted inland crossings over the Alaska Peninsula (USFWS 2004*a*). In the winter of 2025/2026, heavy and persistent ice covered Izembek Lagoon and connected waters, including out past the Kudiakof Islands, the barrier islands enclosing the lagoon. Sea otters were documented on inland tundra, several miles from open water, in late March 2026 during this period of persistent ice cover (A. Williams, USFWS, pers. comm. 2026*c*). Sea otters were also reported traveling inland or stranded on ice in Nelson Lagoon and farther north on the peninsula; several dead sea otters (approximately 50) were reported seen from Ilnik Lake to False Pass (including at Izembek Lagoon), indicating a widespread event (A. Williams, USFWS, pers. comm. 2026*c*, L. Polasek, ADF&G, pers. comm. 2026). Two sea otter carcasses were collected and both tested negative for

HPAI. One was also tested for HABs with negative results. Necropsy results indicated starvation (K. Beckmen, ADF&G, pers. comm. 2026).

4.4.3 Ongoing Activities and Threats in the Action Area

Threats to recovery of the southwest Alaska DPS of northern sea otter were summarized in the Status of the Species section. These factors include predation, disease, subsistence harvest, habitat loss, oil spills and other contaminants, and climate change. Threats in the action area typically mirror those previously described for range-wide threats to the species, and include the following: marine vessel traffic, fisheries, wastewater discharges and runoff, and noise.

4.4.3.1 Marine Vessel Activity and Fisheries

The Bristol Bay MU includes several small communities whose population totals approximately 300 people (State of Alaska 2026). Commercial fishing is the primary economic activity in the region. Within the MU, there are fish processing facilities in Egegik and Port Moller.

The human population of the South Alaska Peninsula MU is concentrated in the communities of King Cove and Sand Point, with approximately 757 residents and 578 residents, respectively (USCB 2020c).2020c Sand Point is home to the largest fishing fleet in the Aleutian chain (City of Sand Point 2014), while other communities within the region also have strong ties to commercial fishing. There are several fish processing facilities within the MU, in the communities of False Pass, King Cove, Sand Point, and Chignik.

Fisheries bycatch was identified as a threat to northern sea otters in the recovery plan (USFWS 2013). Most documented fisheries interactions with northern sea otters are self-reported, so it is unknown how many otters are injured or killed by fishing operations each year. These self-reported fisheries interactions average less than one otter per year, and between 2017 and 2021, there were no reported mortality or serious injury events in Alaska commercial fisheries for the southwest Alaska stock of northern sea otters (USFWS 2023*a*). Based on reports of interactions, otters are more likely to be impacted by the set gillnet fisheries in the region than by other fisheries such as purse seine and trawl fisheries. However, set gillnet fishing does not tend to occur in the rocky nearshore areas preferred by sea otters, which might reduce the likelihood of sea otters interacting with fishing gear (Funk 2003). Within Izembek Lagoon, permitted fishing includes commercial salmon seining.

The South Unimak fishery, which includes Cold Bay, was monitored for bycatch in 1991. In this area there were 373 observed driftnet sets, of which 8 sets (or 2.1 percent of observed sets) resulted in a sea otter net encounter (net encounter = mammal observed within 32.8 ft [10 m] of active driftnet, includes entanglements). None of those encounters resulted in sea otter entanglement or injury (NMFS 1991). However, the driftnet bycatch information for Prince William Sound does show sea otter entanglement that year; of 3,166 observed sets, there were 92 sea otter net encounters (2.9 percent of observed sets), and 8 of those resulted in entanglement but no mortality (NMFS 1991).

Boats operating in sea otter habitat run the risk of disturbing sea otters, displacing sea otters, or striking otters with the boat propeller or hull causing injury or death. The likelihood of vessel strikes is primarily related to vessel speed (Vanderlaan and Taggart 2007), and most documented vessel strikes of sea otters involve small, fast-moving vessels (USFWS 2020). We do not have a way to directly measure current fishing activity or other vessel uses in this location. We derive an estimate of current vessel activity from a study conducted at Izembek Lagoon in the 1980s (Ward et al. 1994). In the 1980s, vessel activity that led to brant disturbance occurred at a rate of 0.02 to 0.05 events per hour (Ward et al. 1994; Appendix B). We assume brant responded to some but not all vessels in Izembek Lagoon, and the reaction rate reported in that study therefore gives a minimum measure of vessel activity in the lagoon during the study period. Although sea otters are not expected to show the same responses or response rate to vessels as waterfowl, information provided by the Ward et al. (1994) study serves as the best available proxy to measure baseline vessel activity in Izembek Lagoon overall. We consider a 9-fold increase from historical levels to be a reasonable proxy for current vessel activity in Izembek Lagoon, see section 4.2.4.3, Appendix B). We therefore estimate current vessel activity occurs in Izembek Lagoon at a minimum rate of 0.18 to 0.45 events per hour. This rate measures the activity of small vessels used during waterfowl hunting, in areas overlapping sea otter distribution in Izembek Lagoon. There is currently no published, peer-reviewed estimate of annual northern sea otter deaths attributed to vessel strike. The Service does maintain a stranding program to track stranding information and cause of death, but due to the limited spatial extent of the stranding program outside of Kachemak Bay in the southcentral population, the total injury/mortality related to vessel strikes is unknown for the southwest DPS. However, we can use existing reports and published data to extrapolate an estimated rate of vessel strike mortality for northern sea otters across Alaska.

Data from southern sea otter mortality reports from 1998 to 2013 (Kreuder et al. 2003, USGS and California Department of Fish and Game, unpublished data cited in 77 FR 59211–59220, September 26, 2012) indicate a rate of vessel strike mortality in California of 2.6 sea otters per year, or about 0.1 percent of the population size (84 FR 10224-10251 March 19, 2019). Applying 0.1 percent to the entire Alaska population of northern sea otters (51,935 individuals) results in an estimate of 52 sea otters per year killed by vessel strike (51,935 individuals x 0.001 = 51.9). This is a reasonable estimate of vessel strikes that occur across the state given the amount of vessel traffic occurring across the range of northern sea otters. If we assume, based on previous observations, there would be 1,000 northern sea otters in Izembek at most, we can then use 0.1 percent to estimate the current rate of vessel strike mortality in Izembek Lagoon. This results in an estimate of 1 sea otter per year that is expected to die by vessel strike in Izembek Lagoon. If we assume there would be 250 sea otters in Kinzarof Lagoon at most, then we estimate the mortality rate by vessel strike would be 0.25 sea otters per year or 1 sea otter every 4 years (1 year ÷ 0.25 sea otters per year = 4 years). It is important to note that this calculation is not based on peer reviewed estimates, does not account for vessel traffic specifics and that mortality reports likely do not represent an unbiased sample with respect to cause of death because carcass deposition and retrieval are dependent on carcass size, location, wind, currents, predation, and other factors. These estimates represent a current baseline for vessel strike, and do not account for increases in vessel traffic due to the road.

4.4.3.2 Harvest

Coastal-dwelling Alaska Natives are legally allowed to harvest sea otters for subsistence use or for creating and selling authentic handicrafts or clothing. Reported harvest of northern sea otters is generally minimal with the exception of Kodiak Island, where most reported sea otter harvest occurs. The number of sea otters taken during subsistence harvest is considered to be sustainable and have little population impacts (USFWS 2020). However, impacts to specific MUs, particularly those with smaller populations sizes like the South Alaska Peninsula MU, have not generally been considered.

From 2014 to 2025, a total of 56 sea otters were reported harvested from the Izembek Complex and surrounding areas (i.e., King Cove, Cold Bay, Kinzarof Lagoon, and Izembek Lagoon) (C. Solano, USFWS, pers. comm. 2026; from MTRP data). During this time, annual harvest ranged from zero to fourteen sea otters; with zero to nine harvested in Cold Bay, Kinzarof Lagoon, and Izembek Lagoon (average of 2.2 sea otters per year), and zero to seven harvested near King Cove (average of 2.5 sea otters per year). Most were harvested from the South Alaska Peninsula MU. Reports indicate only three sea otters have been harvested from Izembek Lagoon, in 2000, 2013, and 2015 (C. Solano, USFWS, pers. comm. 2025).

4.4.3.3 Environmental Contaminants

The embayment of Cold Bay is a category 4b impaired waterbody (ADEC 2020*a*), impaired by petroleum hydrocarbons, oils, and grease (ADEC 2020*b*). The primary contamination sources are historical leaks and spills associated with aboveground tanks, piping, and buried drums and unidentified source leaks (ADEC 2020*b*). Sea otters are vulnerable to hydrocarbon contamination because oiling of fur can impair their ability to thermoregulate, and they also experience health consequences due to oil toxicity through direct exposure and through trophic transfer (Siniff et al. 1982, Bodkin et al. 2002, Dean et al. 2002, Peterson et al. 2003). Exposure to hydrocarbon contamination can ultimately lead to mortality in sea otters.

Additional sources of pollution in the area include a permitted residential sewage lagoon outfall, which discharges treated effluent into Cold Bay (ADEC 2025). Sewage outfall is a source of reverse zoonotic pathogen exposure for sea otters. In California, correlative mapping of southern sea otters with *Toxoplasma* infections shows clustering of positive cases in areas of sewage outfall into marine environments (Jessup et al. 2000). Southern sea otters swimming near wastewater effluent in Central California also had a higher probability of *Cryptosporidium* and *Giardia* infections (Adell et al. 2016).

4.5 Status of Designated Critical Habitat for the Southwest DPS of Northern Sea Otters within the Action Area

The action area overlaps with two MUs of designated northern sea otter critical habitat - Bristol Bay MU and South Alaska Peninsula MU. The Bristol Bay MU is further divided into subunits and only the Izembek Lagoon Subunit is located in the action area (Figure 24).

The majority of the Bristol Bay MU coast is exposed except for the large bays (Ugashik, Port Heiden, Herendeen, and Bechevin bays) and Izembek Lagoon. Canopy-covering kelps and dark brown bladed kelp are few and scattered along the coastline. The Izembek Lagoon Subunit consists of an estimated 130 mi^2 (337 km^2) of the nearshore marine environment within the Izembek Lagoon and Moffett Lagoon systems. Sea otters are known to frequent the lagoon system and regularly haul out on the islands and sandbars that form the northern boundary of these systems, such as Glen, Operl, and Neumann Islands (74 FR 51988). Large numbers of otters have also been observed hauling out along the edges of the sea ice within the lagoon in winter. The Izembek Lagoon subunit contains most of the identified PCEs (1, 2, and 4). While Izembek Lagoon does not contain kelp forests (PCE 3), it does contain small bands of patchy and continuous soft brown kelp (*Laminaria*) species, primarily in Norma Bay and Applegate Cove (NOAA 2025). Prey species (PCE 4) such as gastropods, clams and mussels (bivalves), and crabs (crustaceans) are known to occur in Izembek Lagoon (Tippery 2013, Ward et al. 2022).

In a recent study comparing benthic invertebrate samples in Izembek Lagoon in two sample years (1998 and 2019), the occurrence of bivalves and gastropods – prey items used by sea otters – did not appear to have changed significantly. However, there was a significant reduction in total biomass of bivalves and crustaceans, and the mean size of bivalves and gastropods was also significantly smaller, in 2019 compared to 1998 (Maliguine et al. 2025). These data indicate changes to groups of benthic invertebrates that sea otters prey upon. Sea otters may need to shift their foraging behaviors to accommodate ongoing changes in prey resources.

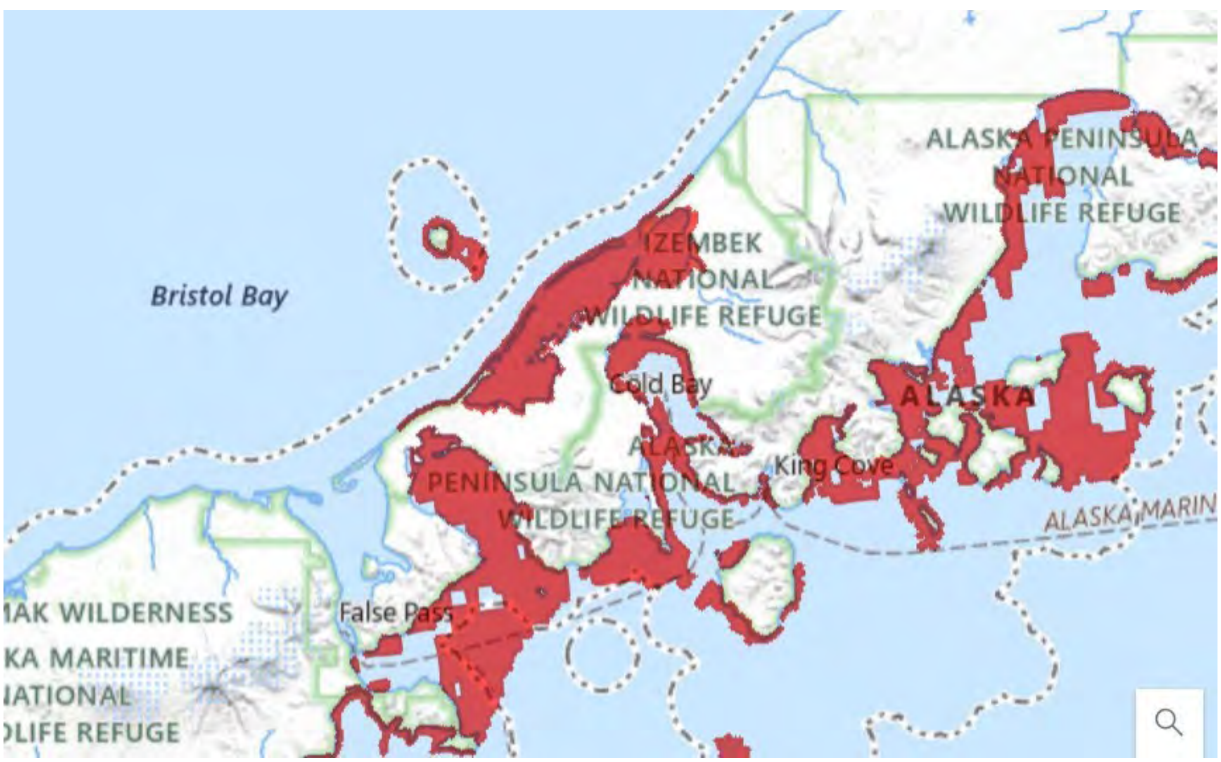

Figure 24. Sea otter critical habitat (in red) within and in proximity to the action area.

The South Alaska Peninsula MU consists of an estimated 1,909 mi^2 (4,946 km^2), collectively, of the nearshore marine waters ranging from the mean high tide line to the 65.6-ft (20-m) depth contour as well as waters occurring within 328.1 ft (100 m) of the mean high tide line. Canopy-covering brown kelps are widespread throughout the South Alaska Peninsula MU except for the southern side of Unimak Island. Dark brown bladed kelp is distributed throughout the MU except for the southern side of Unimak Island as well. The South Alaska Peninsula MU contains all the identified PCEs. Within Kinzarof Lagoon, small bands of patchy and continuous soft brown kelp (*Laminaria*) are present. The nearshore habitat of Cold Bay is lined with patchy and continuous bands of soft brown kelp (*Laminaria*) species and dragon kelp (*Eularia fistulosa*) (NOAA 2025). Continuous, and patchy eelgrass (*Zostera marina*) habitat also occurs around much of Cold Bay (NOAA 2025). Prey species (PCE 4) such as crab and gastropods are known to occur in Kinzarof Lagoon.

Kelp communities are sensitive to pollution, sedimentation, and turbidity. Pollution from non-point and point sources including sewage, seafood waste disposal, and coastal runoff may contribute to kelp forest degradation. For example, high sedimentation from coastal run-off may bury new plant shoots. Sedimentation and turbidity also impact kelp through decreasing sunlight or physical influence of particulate matter (Longstaff and Dennison 1999, Gorgula and Connell 2004, Watanabe et al. 2016, Picard et al. 2022). Kelp may then experience reduced growth rates and reproductive success in more toxic waters and sediments. Studies on microscopic stages of kelp suggest that kelp is sensitive to sewage, industrial waste discharges, and other causes of poor water and sediment quality (Coelho et al. 2000, Contreras-Porcia et al. 2023). Other threats to kelp include climate change and overgrazing by fish or sea urchins.

Past and ongoing impacts that modify and reduce the quality of PCEs to provide habitat, prey, and shelter from predators include fishing, hunting, ATVs and trails, contamination, and marine vessels (e.g., skiffs, fishing vessels, and inflatable boats) within Izembek Lagoon and Kinzarof Lagoon. Under State general permits, users are allowed to use certain motorized vessels (e.g., skiffs, fishing vessels, and inflatable boats) within Izembek Lagoon. Use of ATVs, marine motors, and fishing gear causes increased sedimentation and turbidity into the surrounding wetlands, leading to reduced quantity or quality of nearby kelp communities. In addition, there are similar ongoing impacts of sedimentation to kelp from military roads, motorized trails, marine vessel use in shallow water and mud flats, and dock construction.

Past military use has contributed to various contaminants in the area. One example is the White Alice Communication Site, near Grant Point, along the nearshore of Izembek Lagoon (Hazard ID: 2826; ADEC 2025). This site is associated with previous Air Force Activity. The structure was demolished between 1987 to 1988, but diesel range organics detected at the site remained above ADEC cleanup levels until 2006. According to ADEC, multiple active contaminated sites remain along the coast of community of Cold Bay, two of which are related to past military use. These contaminants include a hydrocarbon seep and diesel range organics.

4.6 Past and Present Consultations

Past and present actions, their effects on listed species and designated critical habitat, and the levels of anticipated take have also been considered in the environmental baseline. Table 10 summarizes the past and present Federal projects in the Action Area that have already undergone section 7 consultation. We include consultations that overlap with the action area or have ongoing effects to individuals from both listed species that may overlap with the action area; the estimated take of Steller's eiders and northern sea otters is presented. There are no past or current consultations that anticipated adverse effects to designated critical habitat for either species in the Action Area. Some projects had discreet take estimates for the entirety of the proposed action relevant to the consultation, while others had estimates of annually occurring take. For Steller's eiders, we considered any consultation affecting the listed Alaska-breeding population as potentially overlapping with and therefore affecting individuals that occur in the action area analyzed in this consultation; inclusion of these activities that may occur outside the geographic scope (and therefore outside the environmental baseline) of the action area for this consultation provide context for the environmental conditions currently experienced by individuals occurring in this action area. For northern sea otters, only two consultations overlap with the management units relevant to the action area analyzed in this consultation. Two consultations including northern sea otter take estimates, demarked with an asterisk (*), are not relevant to the two management units overlapping the action area. These consultations were included in Table 10 due to their relevancy to Steller's eiders.

Based on past and current consultations, annual ongoing take of Alaska-breeding Steller's eiders is up to 12 nests (11.16 per year rounded up) and up to 10 individuals (9.84 per year rounded up). For northern sea otters, up to 1,100 sea otters may be captured and treated in rehabilitation centers per year; of these, up to 200 individuals may suffer injury or death during treatment, almost exclusively from their pre-existing medical condition that required veterinary treatment; this anticipated take includes a large geographic range that is inclusive of the action area under current consideration, but may also include areas outside of this action area. These totals for sea otters include individuals from all five management units, and only a portion of this total would apply to the management units overlapping the action area.

Table 10. Past and present actions and the levels of anticipated take. Two consultations demarked with an asterisk (*) present take estimates for northern sea otters that are part of a management unit that is not relevant to this current consultation.

Date of Consultation	Name of Project	Project Years	Estimated take of Northern Sea Otters	Estimated take of Steller's Eiders
11/21/2003	Barrow Landfill	Until 2058	N/A	1 nest annually
10/3/2007	MMS and BP Alaska - Liberty Development Project	100 years	N/A	1 nest
5/8/2012	BOEM Beaufort and Chukchi Sea Planning Area Oil and Gas Lease and Activities	35 years	N/A	1 individual
5/25/2012	FHWA Barrow Roads Improvement Project	50 years	N/A	22 nests
3/30/2015	Oil and Gas Activities Associated with Chukchi Sea Lease Sale 193	20 years	N/A	1 individual
4/30/2015	East Barrow Shareholder Lot Roads	50 years	N/A	2 nests total and 1 individual annually
5/22/2019	BOEM - Cook Inlet Oil and Gas Lease Sale 244*	5 years	20 individuals disturbed annually* 9 individuals killed or injured total*	8 individuals
3/13/2020	Coastal Plain Oil and Gas Leasing Program for Arctic National Wildlife Refuge	135 years	N/A	1 individual
3/24/2021	EPA and NMFS permits for Alaska Groundfish Fisheries	2021-2025	N/A	3 individuals

Date of Consultation	Name of Project	Project Years	Estimated take of Northern Sea Otters	Estimated take of Steller’s Eiders
5/7/2021	Construction and Operation of a Harbor at Little South America, Unalaska, Alaska	50 years	N/A	6 individuals
2/21/2023	U.S. Air Force (USAF) Remote Installation Remedial Activity	2023-2035	N/A	1 nest
4/26/2023	NOAA Office of Coast Survey Hydrographic Surveys	2 years	N/A	3 individuals
8/25/2023	BOEM - Cook Inlet Oil and Gas Lease Sale 258*	5 years	60 individuals disturbed annually* 6 individuals injured or killed total*	3 individuals
10/30/2023	International Wildlife Research Permit for Sea Otter Recovery Actions	5 years	1,000 individuals captured and treated 200 individuals injured or killed	N/A
4/17/2024	Regional Recovery Permit for USFWS Activities	5 years	N/A	2 individuals
5/1/2024	National Science Foundation (NSF) Andresen research	2024-2027	N/A	4 nests
5/1/2024	USFWS Shorebird Breeding Ecology Studies near Utqiaġvik	2024-2026	N/A	7 nests
5/23/2025	NMFS Alaska Fisheries Science Center Research Activities	5 years	N/A	3 individuals

Date of Consultation	Name of Project	Project Years	Estimated take of Northern Sea Otters	Estimated take of Steller's Eiders
3/13/2025	USFWS Managing Migratory Bird Subsistence Hunting in Alaska: Regulations for the 2025 Spring/Summer Harvest	2025	N/A	3 individuals
5/2/2025	Alaska SeaLife Center Recovery Permit	5 years	100 individuals captured and treated	N/A
6/23/2025	Office of Marine and Aviation Operations (OMAO) Vessels Operations in U.S. Waters	2023-2038	N/A	2 individuals
7/31/2025	BLM National Petroleum Reserve-Alaska (NPR-A) Integrated Activity Plan (IAP)	70 years	N/A	1 to 6 nests annually
8/31/25	2025 BLM Arctic Refuge Coastal Plain Oil and Gas Leasing Program	2025-2110	N/A	ITS not included in Programmatic Biological Opinion
10/14/25	Izembek National Wildlife Refuge Land Exchange for Proposed Road Corridor	2025-2125	ITS not included, administrative land exchange action	ITS not included, administrative land exchange action
4/1/2026	USFWS Managing Migratory Bird Subsistence Hunting in Alaska: Regulations for the 2026 Spring/Summer Harvest	2026	N/A	7 individuals
In progress	Cold Bay Ferry Reconstruction	2028-2029	TBD	TBD

5 EFFECTS OF THE ACTION

In accordance with 50 CFR 402.02, effects of the action refers to the direct and indirect effects of an action on the species or critical habitat, together with the effects of other activities that are interrelated or interdependent with that action, that will be added to the environmental baseline. The environmental baseline includes the past and present impacts of all Federal, State, or private actions and other human activities in the action area, the anticipated impacts of all proposed Federal projects in the action area that have already undergone formal or early section 7 consultation, and the impact of State or private actions which are contemporaneous with the consultation in process. Indirect effects are those that are caused by the proposed action and are later in time but still are reasonably certain to occur. Interrelated actions are those that are part of a larger action and depend on the larger action for their justification. Interdependent actions are those that have no independent utility apart from the action under consideration.

We analyzed the proposed action's effects using the four categories outlined in the above definition of effects of the action (direct and indirect effects; interrelated and interdependent actions). For indirect effects, we considered those effects that are reasonably certain to occur and our use of that language indicates a consequence was considered an indirect effect of the proposed action.

5.1 Beneficial Effects

We do not anticipate any beneficial effects of the proposed road to Alaska-breeding Steller's eiders or the southwest DPS of northern sea otters.

5.2 Steller's Eider

Effects of the action include increased disturbance, harvest, collision risk, and habitat loss and contamination. A consequence of major concern to Steller's eiders is the increased access to and human use of Izembek Lagoon that is likely to result from the construction of the proposed road. We expect adverse effects to Steller's eiders, which congregate in large numbers in the lagoon, and their habitats. Steller's eiders are more limited in their use of Kinzarof Lagoon and Cold Bay; and although habitats within these sites become increasingly important for eiders during winter icing conditions in the shallower Izembek Lagoon, both waterbodies are already accessible for human use from both Cold Bay and King Cove.

While tens of thousands of Steller's eiders use Izembek Lagoon at various times of year, only a small proportion (approximately 1 percent) of all individuals molting, wintering, or staging during spring migration at Izembek Lagoon are Alaska-breeding Steller's eiders. The current population estimate for the listed entity is 406 individuals (see section 4.2 for detailed discussion and estimates). Using averages from the most recent study years (Table 5), we estimate between 4,840 and 5,866 Steller's eiders use the Izembek Complex for fall molting, of which we further estimate an average of 48 to 59 belong to the Alaska-breeding population of Steller's eiders (or 12 to 15 percent of the listed entity). Note, we use "Izembek Complex" because surveys often combine results to include survey data from Izembek, Moffet, and Kinzarof Lagoons, as discussed in 4.2 Status of Steller's Eider within the Action Area. However, the vast majority of birds are observed within Izembek Lagoon. Following molt, February surveys from 2019 to 2024 estimated 21,228 Steller's eiders winter in Izembek Complex, or approximately 211 Alaska-breeding Steller's eiders (52 percent of the listed entity). The most recent reliable spring estimate in April indicates 37,743 Steller's eiders stage in Izembek Complex, or 377 (93 percent) of the Alaska-breeding population, a reasonable upper estimate. Or, given that half of the Steller's eiders in the spring count were using Izembek Complex, we can assume Alaska-breeding Steller's eiders use the lagoon at the same rate. Our lower estimate is that 203 eiders (or 50 percent) of Alaska-breeding Steller's eiders stage in Izembek Complex in the spring. Use of the Izembek Complex for wintering and spring staging can vary considerably between years depending on ice and weather conditions. A few individuals that skip breeding may over-summer in the area.

For the purpose of evaluating consequences of the action to the listed population, the Service recognizes that any individual Steller's eider could belong to the Alaska breeding population, although the probability is roughly 1 percent with respect to each individual. In the analysis below, the contemplated effects broadly apply to all Steller's eiders in the action area, with an estimated 1 percent of those being from the listed Alaska-breeding population. When we refer to Steller's eiders, we are inclusive of all Pacific wintering individuals, combining both the Russian-Pacific population and the Alaska-breeding population. We do not expect any difference in the relative likelihood of effects occurring to individuals between the two breeding populations; therefore, all effects apply equally to all Steller's eiders regardless from which breeding population they come, relative to their proportion of the total Pacific-wintering population. We specify in our analysis what the expected effects are to the Alaska-breeding Steller's eider only when enumerating a specific number of individuals.

5.2.1 Disturbance

A review of thousands of publications found the following patterns in how waterfowl respond to disturbance (Korschgen and Dahlgren 1992): most disturbance events are caused by human activities on the water (primarily, boating, angling, hunting) or by aircraft; waterfowl responding to these activities may be disturbed by loud noises, rapid movements, and visible features; there is a social effect in response, with large flocks reacting to disturbance more than small flocks; diving ducks and geese are especially vulnerable to disturbance; and repeated disturbances can exclude waterfowl from foraging in preferred habitats and lead to shifts in local site use or permanent emigration out of the area. Flocks of Steller's eiders are easily disturbed during flighted and non-flighted periods (McKinney 1965; D. Safine, USFWS, pers. comm. 2021). The amount of disturbance to Steller's eiders resulting from increased access to the Izembek Isthmus and increased human presence in and near preferred Steller's eider habitats within Izembek Lagoon and other areas of the Izembek Complex would depend on the number of humans using the area; the specific activities occurring and their duration, frequency, and intensity; accessibility of eiders and their habitats during these activities; time of year; and other factors that are difficult to predict and assess.

In multiple studies in Izembek Lagoon, human-induced disturbance to waterfowl has been documented from hunting and boating (Ward et al. 1994, Stillman et al. 2021), with disturbance events corresponding with the legal waterfowl hunting periods (fall and spring; Stillman et al. 2021). Additionally, most subsistence hunting and fishing activities would overlap the period when Steller’s eiders are present. Disturbance events documented as causing responses in waterfowl at Izembek Lagoon occurred more frequently in areas closer to road-based access points than in portions of the lagoon farther from roadways (Stillman et al. 2021). Pacific brant, a small marine goose that overwinters in Izembek Lagoon, are the best available proxy for how Steller’s eiders might respond to disturbance in the area. Like Steller’s eiders, brant migrate to, stage, and molt in lagoon systems and other protected coastal waters where barrier islands provide predator refugia and where eelgrass, sedges, and algae are plentiful (Cornell Lab of Ornithology 2025). Both species often use similar habitats (primarily eelgrass beds) and portions of the Izembek complex. Steller’s eiders typically form dense, single species flocks, but periodically form mixed-species flocks, including mixing into or near brant flocks (USFWS/Williams et al. 2016, A. Williams, USFWS, pers. comm. 2026*a*).

An observational study aimed at documenting the responses of Pacific brant at Izembek Lagoon to natural and human-caused disturbance (Ward et al. 1994) can be used as a proxy for how Steller’s eiders, which share similar habitat use and distribution to brant in this location, might respond. Flocks responded to 67 percent of the observed disturbance events (n = 1,576; all sources combined). Brant flocks became alert in response to 54 percent of human-associated events and took flight in response to 31 percent; hunting, boating, and helicopters caused the greatest proportion of flocks to depart the study area. Disturbances caused a response by most individuals (greater than or equal to 60 percent) in a flock; and individuals spent 2.2 percent of their time responding to disturbance and 1 percent of their time fleeing the disturbance (Ward et al. 1994). The social behavior of flocks means most individuals within the flock will respond to a perceived threat in accordance with only a few, more startle-prone individuals; and larger flocks tend to exhibit a greater response (Korschgen and Dahlgren 1992, Ward et al. 1994, Knapton et al. 2000, Merkel et al. 2009).

Activities that cause eiders to become vigilant or move away from preferred sites (or “patches” of habitat) in Izembek Lagoon by swimming, diving, or flying would increase energy expenditure and disrupt foraging or resting during the molting, wintering, and spring staging periods. Non-breeding waterfowl generally minimize their time in flight and maximize their time feeding (Korschgen and Dahlgren 1992), and disturbance events that change the balance of their activity budget would have time and energy costs (Stillman et al. 2021). Steller’s eiders exist at the edge of their energetic range (Goudie and Ankney 1986). At all times of year, Steller’s eiders have low flexibility in their daily time budget and their energy reserves to accommodate foraging disruptions, especially during energy-demanding periods (Laubhan and Metzner 1999, Ouellet et al. 2013). In non-breeding Steller’s eiders, foraging comprises approximately one-third to one-half of daily activities (Laubhan and Metzner 1999); rest, including low-activity periods used to digest hard-shelled prey, comprises an important component of daily activities and during molt, should comprise most of the remaining daily time budget (Hohman et al. 1992, Ouellet et al. 2013). Molt is particularly energetically costly, and we predict disturbance would have higher fitness consequences during this period. Fleeing in response to disturbance would also be physically challenging for flightless Steller’s eiders; they could not respond by flying and also have impaired diving ability during molt (Howell et al. 2003, Savard and Petersen 2015).

Swimming and diving would also have high energy costs. Diving is thought to be too energetically costly for Steller's eiders to perform regularly during molt (Petersen 1981).

The importance of access to prey and the consequences of increased energy expense during molt (Savard and Petersen 2015, Maliguine et al. 2025) demonstrate that disruptions to resting and foraging could have consequences to individual physiological condition and, if disruptions are frequent or severe enough, would impact survival of Steller's eiders. Further, Steller's eiders molting in the Izembek Complex might be challenged to meet their energetic requirements (Hollmén et al. 2022, Maliguine et al. 2025) even without human-caused disturbance leading to foraging interruptions/reduced rest and increased energy expenditure. Disturbance to Steller's eiders at Izembek Lagoon in the spring could disrupt important courtship and pair-bonding behaviors that occur in the wintering areas. Effects to individual physiological condition or disruption of courtship and pair-bonding, which occurs during the winter, would also have carryover effects in subsequent seasons. Here, we analyze the expected frequency and magnitude of disturbance events and assess the likelihood of these causing significant biological effects to Alaska-breeding Steller's eiders.

Pacific brant is also a good proxy species for the Steller's eider in terms of their time and energy budgets during staging and migration. They are both relatively small species in their respective taxonomic groups, Steller's eiders being a small sea duck and brant a small goose. Both birds are arctic species breeding in lowland tundra wetlands, far from their molting areas in Izembek Lagoon (USFWS 2019, Maliguine 2024, USFWS/Wilson et al. 2025) and rely on energy reserves to survive the molt through wintering period, subsequently migrate in spring, and successfully reproduce the following year. Models that incorporate empirical observations of disturbance events in Izembek Lagoon predict nearly all brant within Izembek Lagoon should survive the fall through spring periods at a level of disturbance estimated as less than one event per hour. This rate of disturbance is a combination of natural plus human-induced events, primarily bald eagle presence plus hunting and boating activities (Stillman et al. 2021). The models predict brant would increase their feeding time as the combined rate of human and natural disturbance events increases, and an increase in all disturbance events (both natural and human caused) of 1.3 times or more would likely reduce survival. The model further suggested increases in human disturbance alone of up to five times current rates would not affect survival or emigration, suggesting natural disturbance is a more significant driver of the response.

However, this study relied on disturbance inputs only at certain locations where disturbance was recorded by Ward et al. 1994 and it did not encompass potential for an expanded distribution of disturbance events within the Izembek Complex. The model also did not account for any changes in hunting or boating practices in the area. This model-based analysis could not account for finer-scale variations in predation risk or prey abundance and quality within Izembek Lagoon, the energy and time costs to brant of traveling between habitat patches following disturbance events, and the unidentified factors that underpin traditional uses of the Izembek Complex by waterfowl. Like Steller's eiders, Pacific brant in the Izembek Complex are at the edge of their metabolic limits, spending all or nearly all their time feeding, and cannot increase foraging effort to compensate for disruptions and/or the increased energy expenditure of fleeing (Stillman et al. 2021).

Human-caused disturbance can reduce the effective carrying capacity of important non-breeding habitats used by high concentrations of waterfowl (Knapton et al. 2000). Except during the flightless molt period, Steller's eiders would be able to emigrate out of high disturbance areas within the Izembek Complex or to areas outside the complex in the face of increased and chronic disturbance. However, there are few alternative ice-free eelgrass sites in proximity; birds would have to move 62 mi (100 km) south in the Gulf of Alaska to access patchier eelgrass or greater than 311 mi (500 km) away to find sizeable eelgrass beds (Stillman et al. 2021). Therefore, even faced with a substantial increase in the magnitude of disturbance events and/or repeated and prolonged disturbance, we expect most birds would remain in the Izembek Complex within a given season. Some number of Steller's eiders might find refugia within Izembek Lagoon because the relatively low gradient of this waterbody results in shallow water farther offshore (USFWS/Lance et al. 2007). However, similar to the high degree of site fidelity Steller's eiders show to their molting lagoon between years, within their molting lagoon Steller's eiders may show preferential use of specific habitat patches, returning to these locations repeatedly following disturbance events (Flint et al. 2000). Preference for specific patches may be partially due to the benefits of familiarity with available resources and shelter (Hohman et al. 1992) or could reflect quality. We therefore expect a high degree of fidelity to Izembek Lagoon and to specific areas within this lagoon, which would expose Steller's eiders to cumulative disturbance effects during repeated or prolonged events near their preferred habitat patches.

5.2.1.1 Construction and Road Use

Noise levels would increase during construction of the proposed road, and disturbance to Steller's eiders would occur if in-air noise occurs near birds. Barge landings and equipment and materials staging would occur in or near Steller's eider habitats within the nearshore environment of Cold Bay. Site work planned during the summer months, would have little temporal overlap with Steller's eiders, which mostly use Cold Bay habitats during winter months. However, site work that extends into the fall months and beyond would overlap the time of year large, dense aggregations of Steller's eiders are present in the Izembek Complex, undertaking wing feather molt. Most individuals use Izembek Lagoon during this time, but some number of individuals also molt in Kinzarof Lagoon (see section 4.2.1) and use Cold Bay habitats, with use documented beginning in October (Laubhan and Metzner 1999).

At the closest point, the road would be located 0.5 to 1 mi (0.8 to 1.6 km) from Kinzarof Lagoon, 0.7 mi (1.1 km) from Izembek Lagoon, and 1.7 mi (2.7 km) from Moffet Lagoon. Given these distances, basic sound analyses predict noise from most construction equipment and construction activities would attenuate to just above background levels, at most, before reaching areas used by Steller's eiders (USACE 2003, ADOT&PF 2020, 2026*b*). Current ambient noise levels in the action area are approximately 50 dBA (USACE 2003, ADOT&PF 2026*b*). Analysis conducted using the Federal Highway Administration Roadway Noise Construction Model estimated noise from construction equipment to be an equivalent sound level of 72.2 dBA at 200 ft (61 m) from the construction activity and 58.2 dBA at 1,000 ft (300 m; ADOT&PF 2020). Using measured noise levels of various construction equipment, we estimate most noise levels would fall to ambient levels approximately 1 mi (1.6 km) away from the source (Table 11; USACE 2003).

Construction noise is expected to be detectable within parts of the nearshore environments of Izembek Lagoon, Kinzarof Lagoon, and Cold Bay (Figure 25). Impact pile driving, which would take place during installation of a bridge over Southeast Kinzarof Stream, is estimated at 95 to 101 dBA at 50 ft (15 m; Table 11, (ADOT&PF 2026*b*) and is estimated to fall to ambient levels past 1 mi (1.6 km) away from the source (Figure 26). The proposed bridge would be installed approximately 1.3 mi (2 km) northeast of Kinzarof Lagoon and over 5 mi (8 km) from Izembek Lagoon. However, dBAs are weighted for human hearing and may not be applicable to how Steller's eiders experience sound. We lack information needed to predict the exact noise levels that would reach either lagoon and exactly how it would be perceived by eiders. Sound attenuation can be affected by weather, topography, vegetation, etc. However, we assume impact pile driving would be perceived similarly to the sound of a gunshot by birds within hearing range.

If noise from pile driving is still detectable to Steller's eiders in the nearshore of Kinzarof Lagoon, we anticipate some individuals would experience disturbance effects. We expect disturbed Steller's eiders would react with temporary behavioral responses (ranging from vigilance to escape responses that include swimming, diving, or flying away from the area) and/or temporary displacement of individuals or groups. Individuals or groups may repeatedly flush from the area with prolonged or repeated disturbance (i.e., chronic disturbance) and/or may not return until pile driving ceases. Effects of other construction noise would likely cause similar behavioral responses.

Noise associated with ongoing road maintenance and use by vehicles transiting between the communities of King Cove and Cold Bay would be year-round and would occur for the life of the road (i.e., greater than 50 years). Noise disturbance from road maintenance would have similar sources and effects as construction-related noise. Noise levels produced by road use would depend on weather conditions, types and speeds of vehicles, and other factors. Given the low levels of projected daily traffic (average daily traffic is projected to be less than 50 vehicles per day), noise would be of short duration and intermittent. We expect most vehicle noise to fall to ambient levels before reaching Izembek Lagoon (Figure 27). Vehicle traffic would likely be detectable above background levels in small portions of the near-shore environment of Kinzarof Lagoon and Cold Bay (Figure 27).

No pile driving will occur from January 1 through March 30, overlapping periods when eider presence in the action area is the greatest. This will minimize the number of eiders potentially impacted by pile driving because fewer eiders occur in the action area during the fall and summer when pile driving may occur (Table 5). Pile driving that occurs May 1 to October 30 would further minimize impacts to eiders, which are typically still present in large numbers in April; however, pile driving activity is not limited to this time period and could occur April 1 through December 31 (see Conservation Measure 8). Although eiders are present in smaller numbers during fall molt, eiders disturbed during this period would experience higher fitness consequences since molting is energetically costly.

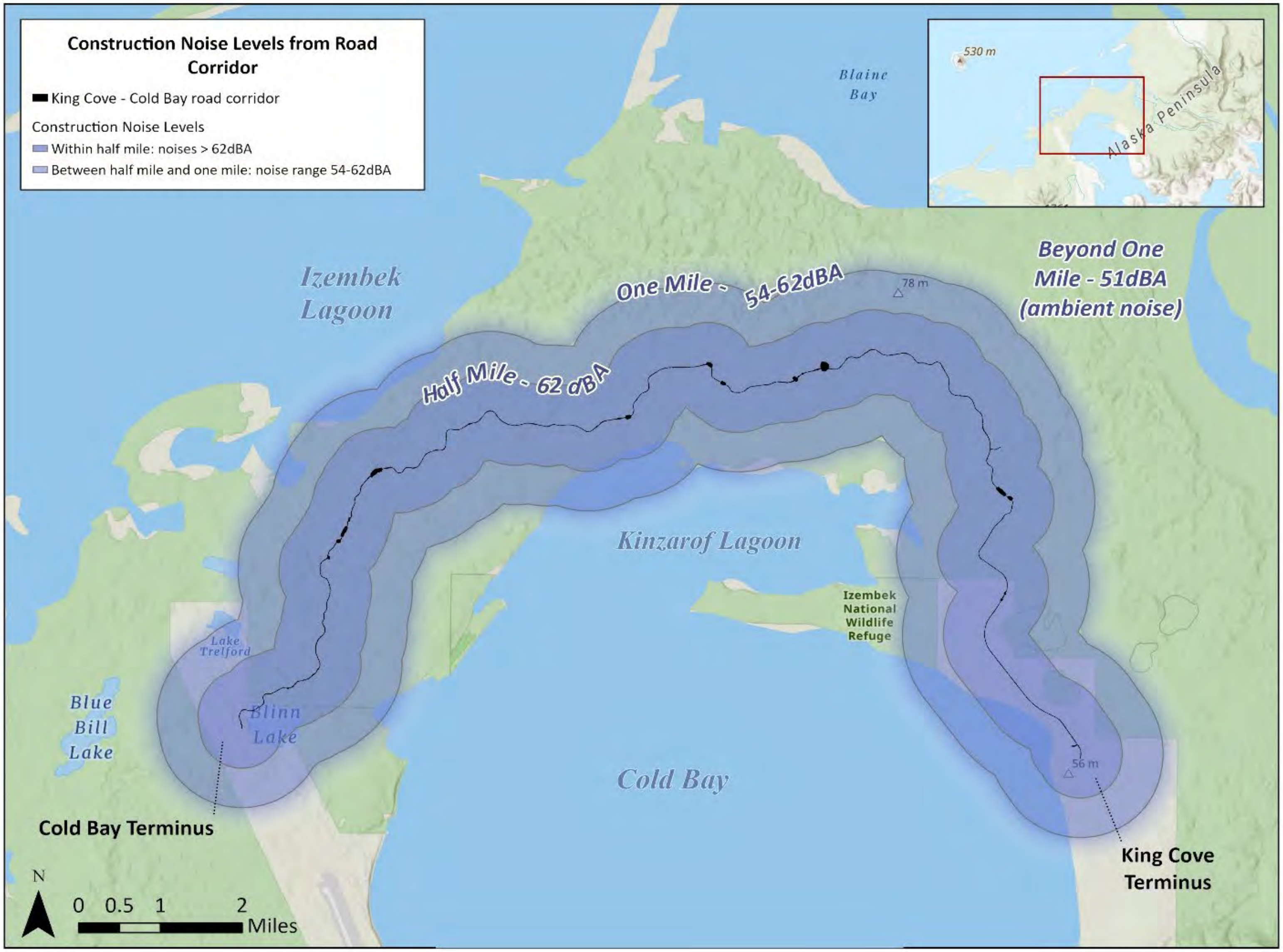

Figure 25. Predicted noise levels from road construction. Noise levels are expected to exceed ambient within a mile from the road (blue buffers) but are expected to fall to ambient levels past a mile. USFWS-made figure based on information referenced in ADOT&PF 2026b.

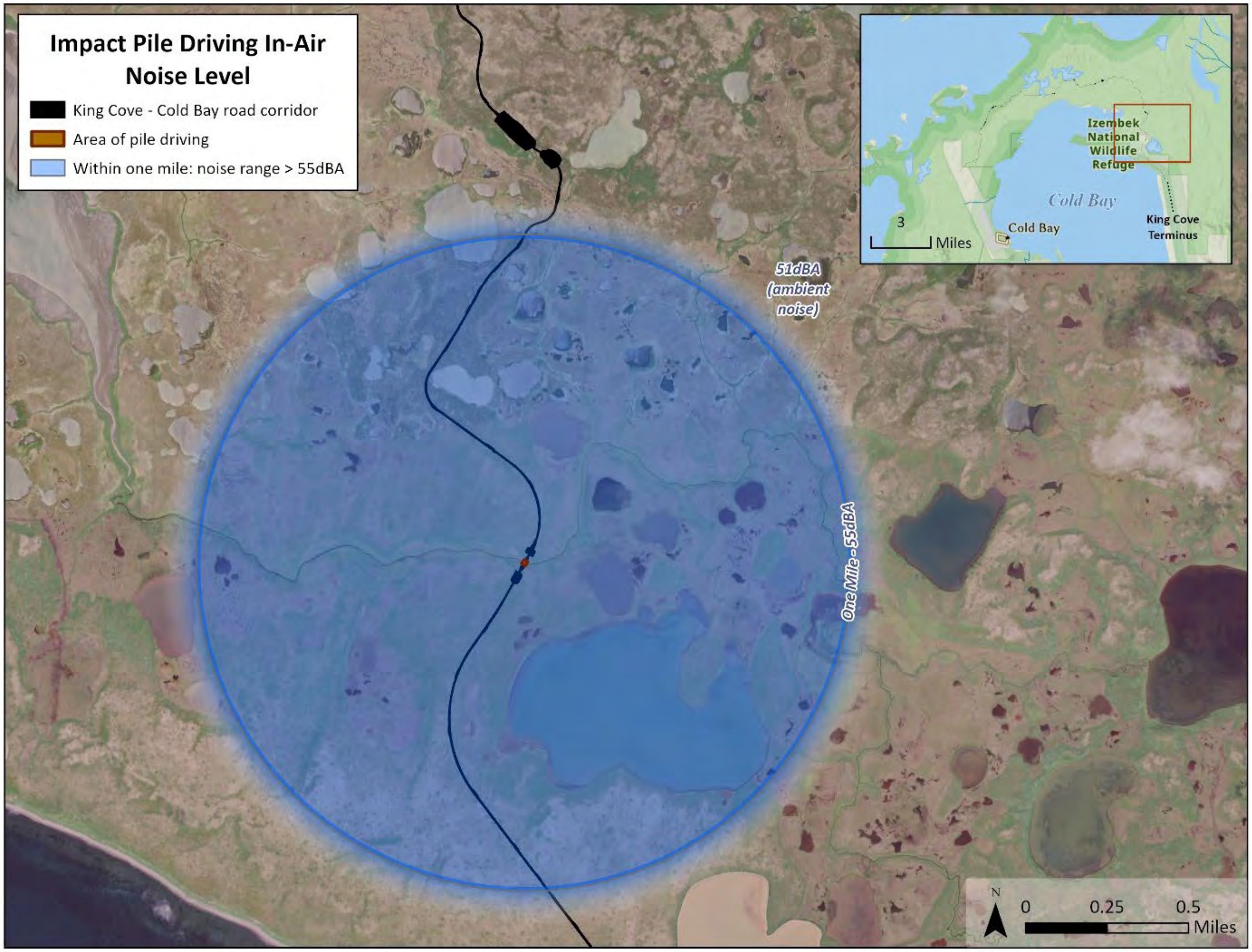

Figure 26. General predicted noise levels (in A-weighted decibels[dBA]) from pile driving. Noise levels are expected to reach ambient past 1 mile (1.6 kilometers) away from the source. USFWS-made figure based on information referenced in ADOT&PF 2026b

Unexploded ordinances could be encountered and necessitate controlled designation for health and human safety. We expect detonating ordnances to have similar noise effects as gunshots; however, given lack of certainty in encountering one, we do not consider this activity qualifies as an indirect effect of the action.

In summary, we expect noise disturbance due to pile driving, construction, and road use would affect most Steller's eiders within hearing range. Construction during the summer months would disrupt, at most, a few over-summering individuals; if fall migrating/pre-molting birds arrive in the Izembek Complex during active construction, increasingly large numbers would be exposed to limited, temporary, and periodic disturbance that would result in adverse effects ranging from behavioral responses to displacement. Behavioral responses would include some level of time and energetic costs to Steller's eiders through disruptions to foraging and resting and time spent fleeing the source, and the effects of pile driving or construction would accumulate during the active period of these activities. Effects from pile driving would only occur during a portion of the anticipated 3-year construction window while other noise effects from construction may occur year-round. Noise associated with road maintenance and use would be year-round and would occur for the life of the road. During times of the year when eiders are present in the highest numbers (November 1 to April 30), construction will only occur during daylight hours. Thus, eiders that move away from construction disturbance could temporally shift behavior and still access those sites when disturbance is not occurring. Given the ability of eiders to shift to other preferred habitats when disturbed, we do not expect temporary construction noise above ambient levels in discrete areas of the nearshore to significantly disrupt eider breeding, feeding, and sheltering.

Table 11. Measured noise levels of various construction site equipment (USACE 2003).

	Distance from noise source		
Equipment	**50 ft (15 meters) dBA**	**0.5 mile (0.8 kilometer) dBA**	**1 mile (1.6 kilometers) dBA**
Heavy truck	91	57	51
Scraper	88	54	48
Air chisel	88	54	48
Pile driver	95	62	55

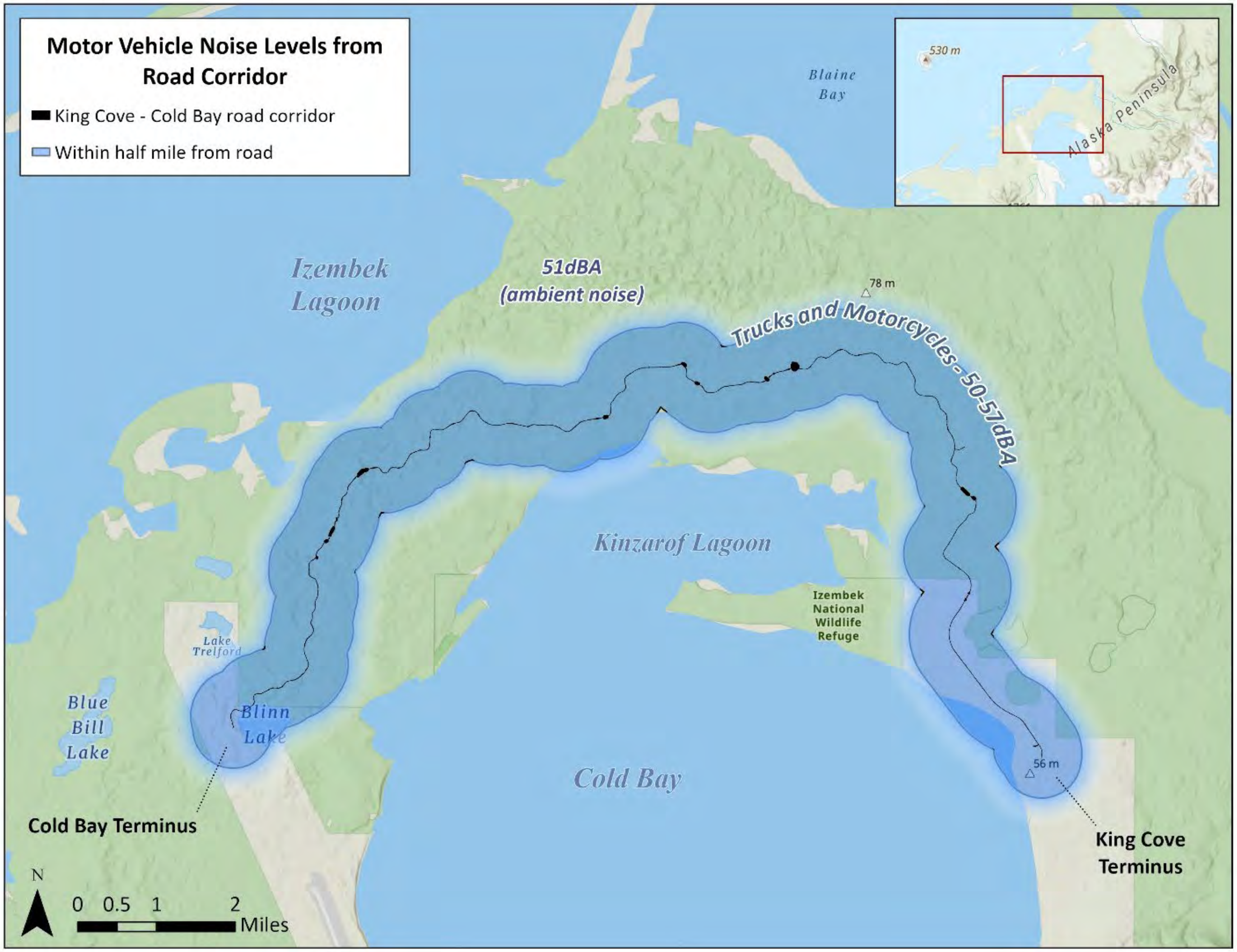

Figure 27. Predicted noise levels from vehicle traffic along the proposed road. Noise levels are expected to exceed ambient within a half mile from the road (blue buffer), but are expected to fall to ambient levels past half a mile.

5.2.1.2 Increased Sport and Subsistence Hunting of Waterfowl

We expect the proposed road, which enables vehicular travel in closer proximity to Izembek Lagoon, would result in increased hunting activities of both residents and non-residents in Izembek Lagoon. This indirect effect of the action would result from, reflecting increased harvest activities by residents participating in subsistence use (either during the spring-summer subsistence season or the fall-winter general hunting season) plus increased hunting from non-resident hunters during the fall-winter general hunting season. We are reasonably certain increased harvest by King Cove residents would occur due to interest expressed by community members (Pacific Rim Reporting 2024). We are also reasonably certain increased access to a prime waterfowl hunting location would increase non-resident hunting, particularly given evidence that when logistical constraints are lowered in this remote area commercial interest increases (Appendix A). Thus, increases in hunting in Izembek Lagoon are reasonably certain to occur and would not occur but for the proposed action.

Hunting of Pacific brant, emperor geese, and other legal species occurs from both shoreline-based locations and from boats on-the-water. Although most hunting activities in Izembek Lagoon occur in nearshore areas (Stillman et al. 2021), all of Izembek Lagoon is accessible to hunting given current modes of access and hunting methods. We expect no part of the lagoon would offer a certain refugia, and increased hunting in the lagoon would put Steller's eiders at risk of repeated disturbance, including through visual impacts of hunting activities, the impulsive noise of guns shot into flocks, and the social effects of flock responses. Below, we discuss the estimated 2.54- to 2.94- fold increase in hunting at Izembek Lagoon expected due to the indirect effect of the action and the changes in disturbance expected, per the calculations in Appendix A and B.

One limitation to the services currently offered by commercial operators during waterfowl sport hunting is the number of clients they can transport to Izembek Lagoon via motorized modes of travel, including by boat and ATV. We assume relieving some of the logistical constraints for commercial guides and clients, through construction of a road that improves overland motorized access and shortens walking distances, would result in increased interest and participation in hunting. To establish a reasonable proxy for the effect of increasing access and lowering logistical constraints, we compared commercial use data from when there were three guide services in Cold Bay (2009 to 2020) to when there were four guide services in Cold Bay (2021 to 2025). We assume that the change from three to four guide services (removal of a logistical constraint on sport hunting) would mimic the effect of the proposed action (also removing a logistical constraint by providing easier access via the road; see Appendix A).

We also expect an increase in subsistence hunting of waterfowl in Izembek Lagoon and Izembek Refuge as an indirect effect of the proposed action. Izembek Lagoon is a prime waterfowl hunting location because it hosts large, dense aggregations of waterfowl species that are unique in Alaska. Based on traditional harvest by King Cove residents of ducks and geese in Kinzarof Lagoon and embayments along the southeastern coast of the Alaska Peninsula (Langdon 1982, Braund et al. 1986, Fall et al. 1993), where we expect greater effort is needed to harvest waterfowl, it is reasonably certain this community will also participate in waterfowl hunting at Izembek Lagoon with improved overland access. Currently, the community of Cold Bay has road access to Izembek Lagoon and the community of King Cove may access the area by boating to Cold Bay (USFWS 2025). The proposed action would lower logistical constraints and allow the community of King Cove to access Izembek Lagoon directly via a road. We used 2016 data on subsistence harvest of migratory birds by the communities of King Cove and Cold Bay to extrapolate and establish baseline subsistence hunting effort based on the most recent U.S. Census (ADF&G 2025; Appendix A).

We expect subsistence hunting in Izembek Lagoon to increase after the road is built because it lowers logistical constraints for the community of King Cove. However, there is uncertainty regarding the magnitude of change in King Cove subsistence harvest practices due to the proposed road and how this may shift waterfowl hunting to Izembek Lagoon (an area of higher importance to Steller's eiders). Personal testimony from December 2024 indicates community members would benefit from the increase in subsistence access afforded by the road (Pacific Rim Reporting 2024). Other anecdotes from the community indicate it would be impractical to drive to Izembek Lagoon, particularly with trailered watercrafts, given current high gas prices and access to closer hunting areas (G. Hennigh, City of King Cove, pers. comm. 2026). Given the range of community testimony, we expect some portion of current harvest effort by the community of King Cove would shift to Izembek Lagoon. Thus, we assume that approximately 50 percent of the current harvest effort of King Cove could occur in Izembek Lagoon as a result of increased access provided by the construction of a road (see Appendix A for discussion and assumptions). This could occur in the form of a shift in current hunting effort to Izembek Lagoon or as an increase in overall hunting effort (i.e., the same amount of hunting occurs in current locations accessible by King Cove and additional hunting occurs in increasingly accessible locations like Izembek Lagoon). We consider this a reasonable estimate of changes in community harvest over the 50-year lifetime of the road.

Based on responses of Pacific brant (as documented in Ward et al. 1994), brant banding data (Lech et al. 2017, Leach et al. 2019 Stillman et al. 2021) and client use data (USFWS/Izembek Refuge, unpublished data), we estimate current hunting activity in Izembek Lagoon results in hunting-caused disturbance at a rate of 0.54 to 1.35 events per hour. We predict a 2.53- to 2.94-fold increase in all hunting activities (combined subsistence use and sport hunting) at Izembek Lagoon relative to current levels (see Appendix A for detailed discussion of these calculations). Based on CUDs and CUD equivalents, 30 to 35 percent of the change is anticipated due to increased subsistence harvest by King Cove and 60 to 65 percent of the change is anticipated due to increased sport harvest. Using the 2.53- to 2.94-fold increase in hunting activity, we calculated a proportional increase in flight time, disturbance time, and percentage of daytime hourly budget from baseline levels (Table 12; Appendix B). The proposed action would result in 1.71 to 4.96 minutes of disturbance per hour, of which 0.77 to 2.24 minutes would be a flight response (Table 12; Appendix B). We also predict construction of a road across the Izembek Isthmus would result in 1.37 to 3.97 hunting-caused disturbance events per hour where those hunting events occur. As indicated above, both use of Izembek Lagoon and hunting pressure in Izembek lagoon are not ubiquitous.

Table 12. Upper and lower estimates of effects of hunting caused disturbance on brant in Izembek Complex, at different time periods. Lower historic disturbance estimates are based on 1985-1987 data, and all other values represent increases calculated per the details of Appendix A and Appendix B. Source: Ward et al. 1994

Hunting Disturbance	Flight Time Estimates (minutes/hour)		Disturbance Time Estimates (minutes/hour)		Percentage of Daytime Hourly Budget Responding to Disturbance (%)	
	Lower	Upper	Lower	Upper	Lower	Upper
Historic	0.03	0.08	0.08	0.19	0.13	0.31
Environmental Baseline	0.30	0.76	0.68	1.69	1.13	2.82
Condition After the Action	0.77	2.24	1.71	4.96	2.85	8.26

Due to the similarity in distribution and habitat use between Steller’s eiders and Pacific brant at Izembek Lagoon, Pacific brant responses to disturbance in this location are a reasonable proxy for how Steller’s eiders would respond and the magnitude of their response. While Steller’s eiders typically form single-species flocks, they periodically mix with or occur near brant flocks (USFWS/Williams et al. 2016; A. Williams, USFWS, pers. comm. 2026a). Disturbances which cause eiders to become vigilant and/or move away from preferred sites would increase energy expenditure and disrupt foraging and resting (see discussion of disturbance effects in 5.2.1). At Izembek Lagoon, brant first alerted to hunters on land at distances of 0.93 mi (1.5 km; Ward et al. 1994). Thus, we expect any eider within this alert range would be exposed to on-shore or on-the-water hunting disturbance. Steller’s eiders exist at the edge of their energetic range (Goudie and Ankney 1986), therefore, we expect the increase in hunting disturbance to have adverse effects on Steller’s eiders in the project area, including Alaska-breeding Steller’s eiders.

We estimate that between 2.85 and 8.26 percent of the daytime hourly budget of a Steller’s eider would be spent responding to hunting activity after construction of the proposed road if exposed to the level of disturbance events estimated above. These numbers are based on observations from fall 1985 to 1987 (Ward et al. 1994) and are most representative of disturbance during the fall hunting period (September to mid-December, some variability with regulation change). Migratory bird hunting is permitted from 30 minutes before sunrise until sunset, so these numbers are only representative for this period of the day. These numbers do not represent year-round disturbance levels due to hunting; because more hunters participate in the fall hunt than the spring hunt, we expect spring hunting disturbance levels to be lower than these estimates. Other studies building on these disturbance data made similar acknowledgements; Stillman et al. 2021 estimated spring harvest to occur at approximately one third of fall levels. Further, these estimates are derived from areas where large flocks of brant congregate (a preferred harvest species for hunters) and are likely estimates of the disturbance levels within the area of Izembek Complex experiencing the highest intensity of hunting pressure. Disturbance beyond these areas (Figure 19) likely occurs, but at unknown levels. Hunting-related disturbance is variable across the Izembek Complex (Ward et al. 1994), and it is likely that hunting disturbance is lower beyond the study area. Changes in the proportion of hunting occurring from land versus by boat would also vary the distribution of hunting disturbance; with recent indication that commercial hunting is increasingly boat-based. It is also likely that increased hunting due to construction of the road would cause an associated increase in the distribution of hunting-related disturbance.

In summary, construction of a road along the Izembek Isthmus would increase access that is reasonably certain to result in increased waterfowl hunting disturbance throughout the lagoon, including areas used by large numbers of Steller's eiders. Hunting related disturbance would impose time and energetic costs by disrupting foraging, resting, and causing birds to flee. Although each disturbance event is temporary, hunting activity occurs repeatedly throughout the lagoon during legal hunting seasons. Disturbance frequency would be high enough to adversely affect some individuals by creating energy deficits. We expect hunting disturbance to be variable year to year due to changes in regulations, guide services available, weather conditions, etc. This would result in variable effects to eiders with high-disturbance years resulting in lower survival and productivity. Displacement from preferred sites or effects on pair bonding and courtship would further reduce breeding propensity and reproductive success. These effects would persist over the 50-year lifetime of the road, and as long as the road remains passable to ATVs, they would be additive to existing stressors such as reduced prey quality and abundance in Izembek Lagoon.

5.2.1.3 Vessel-based Disturbance

Vessel traffic in Cold Bay would increase slightly due to dedicated barge transport of construction equipment and materials during the 3-year construction window. The applicant would use the existing weekly barge service to the area, with an unknown level of increased barge service specific to the project. Steller's eider presence in the area is low during the summer months, but barging activities in September through April would overlap the time of year Steller's eiders are present in the area undertaking wing feather molt or the spring months when the birds are staging in large numbers. Most individuals present for molt use Izembek Lagoon, but some number of individuals also molt or stage in Kinzarof Lagoon and could be present in Cold Bay (see section 4.2.1). If Steller's eiders were encountered during barging within the action area, they would experience periodic but temporary and limited disturbance that results in effects ranging from a behavioral response to displacement. Project specific conservation measures lessen the anticipated effects. Additional barges (i.e., barges beyond the already scheduled service to Cold Bay) will not be added from December 1 to March 30, avoiding much of the wintering and spring periods when eiders are expected to be present in the embayment of Cold Bay, reducing the potential for effects. Additionally, project specific barges will not travel north of a straight line between the Northeast Hovercraft Terminal and the Cross Wind Cove Hovercraft Terminal, thus avoiding areas where eiders are expected to be present in higher densities (in the nearby lagoons). Additionally, barges will follow best management practices to avoid disturbance and potential collision (1.5 Conservation Measures). With the implementation of these measures, we expect the risk of vessel-based disturbance from project-specific barging to be insignificant.

We also expect vessel traffic in the area is reasonable certain to increase and would be caused by the proposed action due to the increased access provided by the proposed road. Because access is primarily due to hunting activities, we expect most of the increase to be driven by hunting rather than other boat-based activities. A road along the Izembek Isthmus would reduce logistical constraints on all types of hunting in the Izembek Complex and it would facilitate access for the community of King Cove to launch boats along the existing Cold Bay road network, including use of the boat ramp at Grant Point, which is the primary access point for boats using Izembek Lagoon. We do not expect this change would result in a measurable increase in vessel use of Kinzarof Lagoon and Cold Bay, as these systems are already accessible to both communities. It is reasonably certain road access would result in increased vessel traffic and vessel-based activities in Izembek Lagoon, including during periods of the year when Steller's eiders are present in large flocks that include flightless, molting individuals. The amount of disturbance to Steller's eiders resulting from increased vessel use of Izembek Lagoon, which would be afforded by the road between King Cove and Cold Bay, would depend on the number of additional vessels using the area; the specific activities occurring and their duration, frequency, and intensity; accessibility of eiders and their habitats during these activities; time of year; and other factors that are difficult to predict and assess.

Based on historical data from the hunting season, boat disturbance in Izembek Lagoon leads to a flight response in brant 75 percent of the time, with an average flight response of 172.5 seconds (Ward et al. 1994, see baseline vessel disturbance in 4.2.4.3). It is likely the majority of boating activity in Izembek Lagoon during the fall, when the disturbance study occurred, is from hunting. We estimate that hunting has increased ninefold from the 1985 to 1987 study period to present and we estimate an additional 2.53- to 2.94-fold increase in hunting due to the effect of the action (see 5.2.1.2 and Appendix A). Assuming that the majority of boating activity causing disturbance is from boat-based hunting, the anticipated increase in hunting activity would lead to a proportional increase in boating activity in Izembek Lagoon. Therefore, we expect a 2.53- to 2.94- fold increase in boating activity in Izembek Lagoon as an effect of the action, relative to baseline levels. This increase would result in 1.31 to 4.09 minutes of disturbance per hour, of which 0.77 to 2.24 minutes would be a flight response (Table 13, Appendix B).

Table 13. Upper and lower estimates of effects of boating caused disturbance on brant in Izembek Complex, at different time periods. Lower historic disturbance estimates are based on 1985 to 1987 data, and all other values represent increases calculated per the details of Appendix A and Appendix B. Source: Ward et al. 1994

Boating Disturbance	**Flight Time Estimates (minutes/hour)**		**Disturbance Time Estimates (minutes/hour)**		**Percent of Daytime Hourly Budget Responding to Disturbance (%)**	
	Lower	Upper	Lower	Upper	Lower	Upper
Historic	0.04	0.10	0.06	0.15	0.10	0.26
Environmental Baseline	0.37	0.92	0.56	1.39	0.93	2.32
Condition After the Action	0.93	2.69	1.41	4.09	2.35	6.81

As established in 5.2.1.2, brant responses to disturbance in this location are a reasonable proxy for Steller's eider response to disturbance. Although Steller's eiders commonly overwinter in areas of high vessel traffic (e.g., Womens Bay, Unalaska Bay), they are sensitive to vessel traffic in some locations, including Izembek Lagoon (McKinney 1965; D. Safine, USFWS, pers. comm. 2021). Vessel-related disturbance can cause Steller's eiders to pause or cease foraging and resting (also impacting courtship and pair bonding behaviors) and to respond with vigilance or fleeing. The following behavioral responses have been observed in molting eiders at Izembek Lagoon: at up to 0.25 mi (400 m) distance, molting birds typically react to vessel traffic by swimming slowly away; birds swim faster if the vessel approaches; and at close distances (165 to 300 ft [50 to 100 m]), molting Steller's eiders will exhibit high stress and dive to move away from the perceived threat (D. Safine, USFWS, pers. comm 2021). These response distances are similar to those documented in an observational study on Pacific brant at Izembek Lagoon. We estimate between 2.35 and 6.81 percent of the daytime hourly budget of an individual Steller's eider that is exposed to boat disturbance would be spent responding to boating activity after construction of the proposed road (Table 13), and 75 percent of the time the response would be a prolonged flight response (Ward et al. 1994). As discussed, Steller's eiders exist at the edge of their energetic range (Goudie and Ankney 1986), therefore, we expect the increase in boating disturbance to have adverse effects on Steller's eiders in the project area, including Alaska-breeding Steller's eiders.

A minority portion (30 to 35 percent) of the estimated increase in vessel-based disturbance would be due to anticipated changes in King Cove activities (as estimated based on changes in hunting in Appendix A). We acknowledge testimony from the King Cove Group that very few, if any, residents would trailer a small boat along the road to Izembek Lagoon to hunt waterfowl in the fall and currently less than five residents own skiff trailers (G. Hennigh, City of King Cove, pers. comm. 2026). However, given the 50-year lifetime of the road, there is considerable uncertainty about how the roads construction may shift behavior and interest in the King Cove Community. Currently, there are limited reasons for community members to own a skiff and trailer. It is reasonable to expect that the establishment of a road would create new incentives to own a skiff and boat trailer given the new access to a premier hunting destination afforded by the road. Thus, an increase in vessel disturbance from King Cove is expected over the 50-year lifetime of the road and we estimate this increase would be lower than the increase caused by other sources.

These numbers are representative of boat disturbance during the fall hunting season and there is likely to be seasonal variability. The fall study period from which the data is derived has the highest volume of hunters because it is open to resident and non-resident hunters. Thus, it is likely disturbance from boat-based hunting is lower during the spring subsistence hunting season. Other studies building on these disturbance data made similar acknowledgements; Stillman et al. 2021 estimated spring boat-based harvest occurs at approximately one third of fall levels. However, there is likely other vessel-based activity (such as commercial and subsistence fishing) occurring in Izembek Lagoon outside the fall period for which we have no data. Building a road would create new opportunity for boat owners from King Cove to access Izembek Lagoon by trailering their vehicles for any reason, beyond waterfowl hunting.

In non-breeding common eiders using a shallow bay in Greenland, disturbance by vessels was observed to seriously affect eider feeding activity (Merkel et al. 2009). While undisturbed common eiders spent 43 to 66 percent of daylight hours feeding, as the number of boats increased in the area, birds decreased their time feeding and spent increasingly more time swimming or flying. Disturbance also affected resting and social behaviors. Vessel disturbance at levels of 1 to 3 boats per hour resulted in approximately 20 percent of time spent flying or swimming for any individual common eider. In common eiders, flocks of more than 100 birds were more likely to experience foraging disruptions. Repeated disturbances had a cumulative effect; birds that were recently disturbed (within the past hour) were two times less likely to continue feeding; and birds disturbed three times within one hour were observed to cease foraging, instead allocating time to vigilance or to movement behaviors (Merkel et al. 2009).

Steller's eiders are considered to have overall low flexibility in their daily time budget and their energy reserves to accommodate foraging disruptions, especially during energy-demanding periods (Laubhan and Metzner 1999, Ouellet et al. 2013). However, they may be able to accommodate some level of disruption to their normal activities. One study of Steller's eiders in the Izembek Complex showed differences in daily time budgets between eiders foraging in Izembek Lagoon versus Cold Bay. During winter, eiders in Cold Bay spent approximately 12.2 percent more time feeding than eiders in Izembek Lagoon (Laubhan and Metzner 1999). This extra time feeding likely reflected increased energetic costs in Cold Bay (eiders in Cold Bay spent more time in locomotion and less time resting) and/or lower prey value in this water body. Extra feeding time could have tradeoffs; in this study, it was correlated with a reduction in "comfort" activities (e.g., preening, which is an important part of maintaining feather waterproofing and insulating qualities). The ability of eiders to accommodate foraging disruptions or increased energetic costs may be lower now than in the 1980s, as quality and abundance of prey in the Izembek Complex has changed (Maliguine et al. 2025; see section 4.3).

In summary, construction of a road along the Izembek Isthmus is reasonably certain to cause an increase in boating activity in Izembek Lagoon from sport and subsistence hunting that would not occur but for the development of the road.. The estimated increase in boating activity in Izembek Lagoon would increase exposure to boating disturbance in areas heavily used by Steller's eiders. Boating disturbance would impose time and energetic costs by disrupting foraging, resting, and causing birds to flee. Although each disturbance event is temporary, boating activity occurs chronically during legal waterfowl hunting seasons and outside of these seasons. Disturbance frequency would be high enough to adversely affect some individuals by creating energy deficits. We expect boating disturbance to be variable year to year due to changes in harvest regulations, guide services available, weather conditions, etc. This would result in variable effects to eiders with high-disturbance years resulting in lower survival and productivity. Displacement from preferred sites or effects on pair bonding and courtship would further reduce breeding propensity and reproductive success. These effects would persist over the 50-year lifetime of the road and they would be additive to existing stressors such as reduced prey quality and abundance in Izembek Lagoon.

5.2.1.4 Off-road Vehicles

Access provided by construction of a road along the Izembek Isthmus would result in increased off-road use of Izembek Refuge, including through increased incursions by off-road vehicular traffic (as seen elsewhere along the regional road network; see 4.1.7 and Figure 16). Off-road vehicle traffic, including snowmachines (i.e., snowmobiles) and ATVs, is expected to originate from both Cold Bay and King Cove; and off-road incursions onto the tundra would occur between the road embankment and Izembek Lagoon. Although Cold Bay residents have a limited road network by which they can access a small portion of the Izembek Isthmus and Izembek Lagoon via overland travel, King Cove residents do not currently have an easy way to access Izembek Lagoon. Some increased use of the isthmus between the road and the Kinzarof Lagoon coastline is possible, although Kinzarof Lagoon is currently accessible from the road network originating from both Cold Bay and King Cove.

Based on established patterns of off-road use along the existing road network, including documented motorized travel into Refuge lands, we expect off-road vehicle trails to increase consequent to the proposed action. Currently, ATV use occurs both on the shorelines of Izembek Lagoon, Kinzarof Lagoon, and Cold Bay, as well as through inland areas, including on Refuge lands (M. Fosado, USFWS, pers. comm. 2024). We assume ATV traffic facilitated by the road would similarly occur along the shoreline of the lagoon in proximity to areas used by Steller’s eiders. At Izembek Lagoon, Pacific brant first alerted to land-based hunters at distances of 0.93 mi (1.5 km; Ward et al. 1994). Therefore, we assume the increased off-road, motorized travel will occur close enough to flocks of flighted and flightless birds to cause disturbance effects to Steller’s eiders.

We estimate increased off-road vehicular trails consequent to the proposed action using the best available data from imagery before and after the King Cove Extension (USFWS/Williams 2023). This report shows that when the 17.2-mi (27.7 km) King Cove Extension was built, the off-road vehicle trail network extended from 17.3 mi (27.9 km) to 140.8 mi (226.6 km) in a 12-year period (USFWS/Williams 2023). Following the King Cove Extension, there was an increase in total off-road vehicle trails of 123.5 mi (198.7 km; total trail length observed in 2022 minus total trail length observed in 2004). This is a 7.1-fold increase in total trail length observed from a 17.2-mi (27.7-km) road extension. We estimate 7.18 mi (11 km) of new, unsanctioned off-road vehicular trails would be expected per new mi (1.6 km) of proposed road. Because 5.6 mi (9 km) of the new road would be built on existing trails and roads, we do not expect that portion to experience a large change in off-road vehicle use. We therefore anticipate approximately 95.5 mi (153.7 km) of new off-road vehicular trails will impact the Izembek Isthmus with construction of 13.3 mi (21.4 km) of road in areas without current roads or trails, assuming similar patterns of access, terrain, and enforcement.

Assumptions and limitations of this analysis:

- The study area in USFWS/Williams 2023 is comprised of land mostly designated as Wilderness, but it also contains some non-Wilderness areas of Izembek NWR as well as some King Cove Corporation lands. This may result in the 7.1-fold increase being an overestimate of what we would expect to occur due to the proposed action, as some change in off-road vehicle use observed in USFWS/Williams 2023 was sanctioned and/or on lands of different ownership.

- Off-road vehicle trails following the King Cove Extension varied in their usage and the imagery analysis created three categories: high-usage primary trails, moderate-use secondary trails, and single-use tertiary trails. The single-use tertiary trails made up 93.8 mi (151.0 km) of the total 140.8 mi (226.6 km) observed in 2022, or 67 percent of the change.
- The best available data shows changes observed over a 12-year period, yet the proposed action will have greater longevity. After the 2022 data were collected, additional trails were observed in 2023 (USFWS/Williams 2023), so the trail development 12 years post-road construction does not represent a fixed or end state for off-road trail development. Given the greater lifetime of the proposed road than the study data, there is increased opportunity for off-road vehicle trails to develop which would result in our analysis underestimating change.
- The best available data compared October 2004 imagery to May 2022 imagery. We assume that seasonality has no effect on trail observability, which may be a flawed assumption. A follow-up survey occurred in October 2024 to check this assumption, but the survey analysis has not been completed as of May 2026.
- The estimate of 95.5 mi of new off-road vehicular trails is a simple estimate; it does not incorporate or model how off-road vehicle use would change with factors such as distance from community centers, terrain suitability, law enforcement, sanctioned vs. unsanctioned access, and more.
- The ADOT&PF has committed to install signage that informs the public of the law prohibiting vehicular access to anadromous streams and signage and informational products pertaining to off-road travel beyond the road prism (1.5 Conservation Measures). Depending on the effectiveness of the signage and informational products, off-road vehicular trails in the vicinity of anadromous streams may be less than estimated.

The proposed road may serve to increase the current network of all-terrain vehicle trails. However, it is also possible that the presence of the road would reduce the frequency and extent of all-terrain vehicle travel in the Refuge. In 2015, the community of Nuiqsut, Alaska, was connected to an industrial road system for nearby oilfields. The road system has expanded since 2015, and Nuiqsut caribou hunters have access to the road for caribou hunting. Use of the road system has increased steadily, with nearly 80 percent of households using roads for hunting in 2022 (SRB&A 2024, USFWS 2025e). While the road system has become a primary hunting area for Nuiqsut hunters, there has been a decrease in overland all-terrain vehicle travel directly west of the community. While some residents travel off the road by all-terrain vehicle to hunt caribou, many travel solely by road vehicle and hunt caribou only when available within walking distance of the road corridor. Thus, it is possible that the proposed road corridor may reduce residents' reliance on existing all-terrain vehicle trails within the Refuge. While it is likely that some new trails will be established in order to access key hunting or harvesting areas located at a distance from the road, it is also possible that certain trails, particularly in areas of rough terrain and in the vicinity of the proposed road corridor, would see less use as a result of the more easily navigable road system. However, in consideration of the proposed action, a notable difference is that the target hunting species (waterfowl) occupy habitat in the nearshore over 0.5 mi from the road and we do not expect hunting from the roadway itself.

The Gambell evacuation road provides another example of changes in off-road use pre- and post-construction of a roadway. Analysis of aerial imagery by the State indicates a decrease in off-road trail use post construction and their analysis indicates a transportation corridor can reduce the incentive for braided off-highway vehicle travel by giving users a more efficient and less damaging route (ADOT&PF 2026). While the proposed road may consolidate vehicle travel for the purpose of transiting between King Cove and Cold Bay, the road would also provide more direct access to much of the Izembek Wilderness and areas that previously were difficult to access from community centers. This greater access creates a larger area of opportunity for ATV use. The proposed road does not connect to areas of interest in congressionally designated wilderness (such as Moffett Lagoon and Joshua Green River). Absent the road, there were reports of increased vehicle use and evidence of tracks deep into the Wilderness (USFWS/Williams 2023). The road would create miles of new access points for motorized travel and, while it may centralize some use, it is reasonably certain there will be an increase in ATV use as a result of the construction of the road and we have attempted to estimate the increase using the best available data discussed above. We acknowledge this estimate is simplistic and has limitations.

In the absence of better data, we assume snowmachine and ATV traffic have similar noise levels as motorcycles, which measure 90 dBA at 25 ft (7.6 m; DOI/USFWS 2013*a*). At a distance of 0.62 mi (1 km), motorcycle engine noise measures approximately 20 decibels and can be distinguished from background levels in most natural environments (Goldfarb 2023). Therefore, although we lack information needed to predict the exact noise levels that would reach either lagoon from off-road vehicle use, we assume engine noise from use of snowmachines and ATVs on the isthmus within 0.62 mi (1 km) of the shoreline would exceed ambient noise levels at both Kinzarof and Izembek Lagoons and would be detected by waterfowl near the shoreline; noise generated at closer distances to the shoreline would penetrate the lagoon environment. Not all eiders would be disturbed by 100 percent of off-road travel via ATV or snowmachine use along shorelines. However, during the seasons eiders are present in the Izembek Complex, we expect any eiders in nearshore areas would be disturbed by any snowmachine or ATV trip within 0.93 mi (1.5 km) of shoreline and that any trip along the shoreline would disturb eiders at distances of up to 0.93 mi (1.5 km) offshore. We assume off-road routes would be expected to connect between the road embankment and the shoreline of both Izembek and Kinzarof Lagoons; travelers could then travel along the shorelines when engaged in activities accessing Izembek Lagoon or when seeking a direct route that is most conveniently accessed along the shoreline (see Figure 16 and Figure 28).

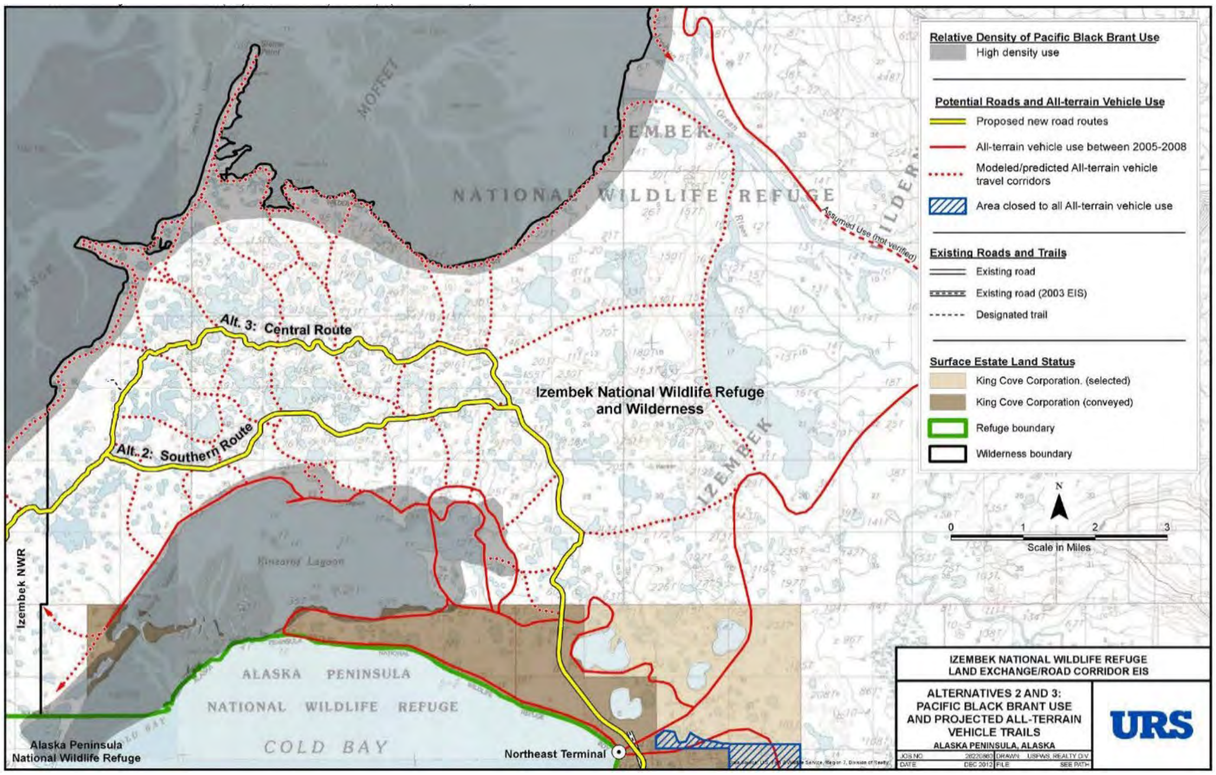

Figure 28. Modeled predictions of ATV use along the Izembek Peninsula and in Izembek Refuge, consequent to construction of two routes under consideration in 2012. The "Alt 2. Southern Route" closely matches the route proposed in the current action under consideration (DOI/USFWS 2013*a*).

We expect Steller's eiders would exhibit similar behavioral responses in the presence of snowmachines and ATVs as they do vessels (see 5.2.1.3). These responses would include increased vigilance and fleeing through swimming, diving, and (outside of molt) flying away from the area. At Izembek Lagoon, we predict responses of Steller's eiders to snowmachines and ATVs would average approximately 3.4 minutes per event (based on the mean disturbance response to helicopters, boats, and eagles; Ward et al. 1994). Prolonged or repeated disturbance (i.e., chronic disturbance) would cause birds to flush from the area for longer and longer periods (as in common eiders; Merkel et al. 2009), and birds may not return until disturbance ceases.

We cannot quantify the current baseline level of off-road vehicle trips that occur during seasons in which eiders aggregate in the lagoon. Based on existing patterns of ATV incursions into Izembek Refuge following construction of the King Cove extension to the northeast terminal, we assume use would be 7.1 times greater than current levels (as calculated above). The study of Pacific brant responses to disturbance during the 1980s did not characterize disturbance by off-road, overland vehicle traffic. Therefore, we are unable to estimate a current rate of disturbance to Steller's eiders or predict the future rate. We anticipate Steller's eiders using near-shore areas (within approximately 0.93 mi [1.5 km] of shoreline) in Izembek Lagoon would experience an increase in disturbance above the current baseline through increased off-road vehicle use. Not all of the anticipated change in ATV-use would occur when and where eiders are present. We lack the observational data needed to estimate how the time budget of an individual Steller's eiders would change in response to disruptions by snowmachines and ATVs.

We acknowledge the Service is actively engaged in constructive dialogue with the King Cove Corporation, the Agdaagux Tribe, and the Native Village of Belkofski, and have begun the development of an agreement to establish a collaborative framework for co-stewardship priorities related to the management, conservation, and protection of the Izembek National Wildlife Refuge. One identified priority is to finalize an off-highway vehicle (OHV) plan to manage and limit off-road use of OHVs, encouraging the use of the road corridor as an alternative to the use of existing or potentially new off-road trails through coordinated public outreach, education, and monitoring. While such a co-stewardship plan may serve to mitigate impacts on listed species and their critical habitat, we are not relying on any mitigation measures from that initiative in this Opinion because that dialogue remains ongoing and has not been finalized.

In summary, given the increased access the road would provide (summarized above), we expect increased snowmachine and ATV use is reasonably certain to occur as an indirect effect of the action and would be of sufficient frequency during sensitive periods – particularly during molt – that this source of disturbance would cause adverse effects to individuals through disruptions to normal behaviors. We estimate a sevenfold increase in ATV use. Where motorized travel occurs close enough to the marine environment, Steller's eiders would be affected. We anticipate disturbance rates would be less than those assumed for waterfowl hunting. The increased disturbance and resulting effects of off-road vehicle use are expected to persist for the foreseeable future (as long as the gravel road remains passable by off-road vehicles, expected to be 50 years).

5.2.2 Harvest of Steller's Eiders

An average 12 to 15 percent of Alaska-breeding Steller's eiders currently use Izembek Lagoon during the fall, and 50 to 93 percent of Alaska-breeding Steller's eiders use Izembek Lagoon during the spring (see sections 4.2.1 through 4.2.3). Therefore, hunting of waterfowl in the action area (including baseline hunting and the expected increase in hunting activity as a consequence of the proposed action) would spatiotemporally overlap 12 to 93 percent of Alaska-breeding Steller's eiders. Although hunting of Steller's eiders is not legal, the presence of Steller's eiders in areas used by waterfowl hunters exposes birds to potential inadvertent or intentional harvest. Female Steller's eiders are particularly difficult to distinguish from other duck species that are commonly hunted, such as long-tailed ducks (*Clangula hyemalis*), black scoters (*Melanitta americana*), and harlequin ducks (*Histrionicus histrionicus*). When mortality of a Steller's eider occurs within areas where the Alaska-breeding and Pacific Russia-breeding populations mix, such as Izembek Lagoon, we recognize any individual Steller's eider could belong to the Alaska-breeding population.

Shooting of waterfowl (and thus potentially eiders) is unlikely to take place from the road because of the distance of the road to most waterfowl habitats and because it is illegal to shoot from drivable surfaces of any road in Alaska. However, a road constructed along the isthmus would facilitate easier overland access (on foot or via ATV) to the shoreline of Izembek Lagoon and this increased access is reasonably certain to increase shoreline-based hunting pressure on waterfowl. We expect the increased number of hunters accessing the Izembek Lagoon shoreline would include resident hunters participating in subsistence or sport hunting and non-resident sport hunters. The increase in hunting activity would originate from both Cold Bay (a combination of sport hunters and subsistence users) and King Cove (subsistence users). King Cove residents do not currently have an easy way to access Izembek Lagoon for vessel-based activities, and we expect a road along the isthmus would also facilitate access from King Cove to Izembek Lagoon, leading to an increase in vessel-based subsistence hunting in Izembek Lagoon.

Mortality of Alaska-breeding Steller's eiders does occur during subsistence and sport hunting; during waterfowl hunting, we assume the likelihood of harvesting Steller's eiders is the same for any individual sport hunter as for any individual subsistence hunter. We expect vulnerability of Alaska-breeding Steller's eiders to hunting mortality will increase with increased waterfowl hunting activities in areas where they aggregate.

We estimate the current rate of unintentional subsistence harvest of Alaska-breeding Steller's eider in the Aleutian Pribilof Islands region is approximately one bird every 4 years, the current rate of subsistence harvest in the action area is one bird every 172 years, and the total harvest by subsistence and non-resident hunters is 1 bird every 38.5 years (see section 4.2.4.1). To calculate the estimated rate of harvest due to the effect of the proposed action, we consider the effect of an increased proportion of Aleutian Pribilof residents using Izembek Lagoon for subsistence hunting. Since we assume that half of King Cove's current hunting effort may shift to Izembek Lagoon as a result of the proposed action (see Appendix A), we add half the population of King Cove to the population of Cold Bay to estimate the number of individuals from the Aleutian Pribilof Islands population that would harvest from Izembek Lagoon (108 Cold Bay residents + [0.5 x 938 King Cove residents] = 577[3]). We then divide the 577 residents accessing Izembek Lagoon by 4,428 Aleutian Pribilof residents to get 0.13, the proportion of residents expected to hunt in Izembek. We multiply the proportion of harvest occurring in Izembek Lagoon by the annual Steller's eiders harvested in the region to estimate the number of Steller's eiders harvested in Izembek Lagoon (0.13 harvest portion x 0.24 eiders harvested per year in the region = 0.0312 eiders per year). We estimate the increased subsistence hunting in Izembek Lagoon will result in 0.0312 eiders harvested per year in the action area, or one every 32 years.

However, this estimate does not include potential eider harvest due to non-residents. We estimate 30 to 35 percent of the future harvest in Izembek Lagoon would occur from subsistence hunting based on total CUD equivalents (see Appendix A). If we assume the rate of eider harvest of Steller's eiders is the same for subsistence and sport hunters, we can estimate total harvest of Steller's eiders in the action area due to the effect of the action. We expect the total rate of harvest of Alaska breeding Steller's eider from both subsistence and sport hunting in Izembek Lagoon to range from 0.089 to 0.10 eiders per year (0.0312 eiders per year / 0.30 lower estimate portion of harvest and 0.0312 eiders per year / 0.35 upper estimate of harvest). This results in an estimated harvest of one Alaska-breeding Steller's eider every 10 to 11 years in Izembek Lagoon after construction of the road.

[3] Note, the Aleutian Pribilofs population number comes from Naves and Schamber 2024 and are based on the U.S. Census Data from 2010, the time period during which their study data is derived. We do not have readily available current data to extrapolate their study based on current populations in the Aleutian Pribilofs Management Region. Thus, we use the U.S. Census Data for Cold Bay during the same time period to approximate the portion of Steller's eider harvest occurring due to subsistence harvest by this community.

It is reasonably certain construction of a road along the Izembek Isthmus would increase waterfowl hunting pressure in areas used by large numbers of Steller's eiders, increasing mortality risk to Alaska-breeding Steller's eiders from shooting, and resulting in adverse effects through shooting mortality of a small number of Steller's eiders. Any resulting mortality would be additive to harvest levels the population already experiences. We currently estimate ongoing harvest of one Alaska-breeding Steller's eiders every 4 years within the Aleutian Pribilof Islands region and one Alaska-breeding Steller's eider 38.5 years within Izembek Lagoon (see sections 3.1.4.4 and 4.2.4.1). We estimate one Alaska-breeding Steller's eider would be harvested every 10 to 11 years in Izembek Lagoon consequent to road construction. We do not expect the loss of one individual from the Alaska-breeding population every 10 to 11 years to have population level impacts.

5.2.3 Collision Risk

5.2.3.1 Collisions with Vessels

Bird species, including eiders and other sea ducks, are attracted to vessels and may circle, ground or collide, primarily due to the effects of light attraction and disorientation (Merkel and Johansen 2011, Ronconi et al. 2015). Steller's eiders have a high collision risk because of their tendency to fly low and fast over the water (Day et al. 2004). Vessels operating in Steller's eider habitats also run the risk of striking eiders with the boat propeller or hull and causing injury or death. Vessel speed influences the likelihood of striking marine wildlife (Silber et al. 2021). Collisions with vessels and vessel strike can result in injury or death to Steller's eiders and potentially to large numbers at once.

Vessel traffic in Cold Bay would increase for dedicated barge transport of construction equipment and materials during the 3-year construction window. Barges, pulled by tugboats, would be used to deliver equipment and materials to the project site via landing sites at the Northeast Terminal and Cross Wind Cove in Cold Bay. Barging activities occurring in summer months would temporally overlap relatively few if any Steller's eiders. Barging activities during the fall months would overlap the time of year Steller's eiders are present in the Izembek Complex, undertaking wing feather molt. Most individuals use Izembek Lagoon during this time, but some number of individuals also molt in Kinzarof Lagoon and could be present in Cold Bay. The slow speed at which barges typically operate (less than 10 knots) reduces the likelihood of strike. Project specific barges will not be added from December 1 to March 30, avoiding most of the wintering and spring periods when eiders are expected to be present in the embayment of Cold Bay. Additionally, project specific barges will not travel north of a straight line between the Northeast Hovercraft Terminal and the Cross Wind Cove Hovercraft Terminal, thus avoiding eiders in that higher density areas. Project-related vessels will also follow the Service's best management practices for vessel operators (conservation measures 1, 2, 10, and 12), further reducing the likelihood of bird-vessel strikes or collisions through the construction period. Thus, we expect the risk of collisions with project specific barges to be insignificant.

Increased vessel traffic is also expected in Izembek Lagoon following construction of the road Beyond construction, we anticipate the majority of the change in vessel traffic would be in the form of small skiffs, primary stemming from boat-based hunting activities in the fall. Other changes in boating (from fishing and other recreational activities) may occur, but we anticipate it will occur at levels lower than what is anticipated during the fall general hunting season. Further, we anticipate the change in vessel traffic to be primarily from small vessels because boat-based hunting typically occurs from small skiffs. This reduces the likelihood vessels would be lighted and thereby reducing the likelihood of Steller's eiders flying into the vessels through attraction and disorientation.

However, an increase in small vessel activity in Izembek Lagoon, particularly during the fall hunting season, would increase spatial overlap between vessels and large numbers of Steller's eiders (including less mobile, molting eiders) and therefore increase the risk of vessel strikes. These small vessels operate at higher speeds, which also adds to risk. As for vessel-based disturbance, the amount of increased collision risk to Steller's eiders resulting from increased vessel use of Izembek Lagoon would depend on the number of additional vessels using the area; the specific activities occurring and their duration, frequency, and intensity; accessibility of eiders and their habitats during these activities; time of year; vessel speed; and other factors that are difficult to predict and assess. We assume the majority of boating activity is from boat-based hunting, and that any increase in hunting activity would lead to a proportional increase in boating activity in Izembek Lagoon. Therefore, we expect a 2.53- to 2.94-fold increase in boating activity and use this estimated increase as a proxy for increase in strike. We anticipate increased boating to be highest in the fall (driven by hunting), which is when eiders are present. Thus, we estimate a 2.53 to 2.94-fold increase in the risk of vessel strike to Steller's eiders (see section 5.2.1.3 for discussion on the anticipated change in vessel activity in Izembek Lagoon).

The best estimate we have for the current rate of collisions and strike of Alaska-breeding Steller's eiders with marine vessels in and near the action area (i.e., on the southern end of the Alaska Peninsula) is one eider every 25 to 417 years (see section 4.2.4.5). We assume birds killed on the southern end of the Alaska Peninsula would belong to the local population concentrating in Izembek Lagoon and further assume this collision rate and associated risk of injury or mortality to any individual bird in the local population would be even across the southern Alaska Peninsula (and actually may be higher in Izembek Lagoon, where there are relatively higher numbers of Steller's eiders). We do not have data on rates of collision in Izembek Lagoon specifically; nor do we have a measurement of vessel traffic rates in Izembek Lagoon or the southern Alaska Peninsula region overall (including for periods with reported collisions). We predict one additional eider will suffer injury or death caused by vessel collision every 8.33 to 164 years, based on the range we anticipate for an increase in vessel activity (calculations for the lower estimate using baseline rates from section 4.2.4.5: 0.0024 Alaska-breeding eiders per year x 2.53 increase in risk of vessel strike = 0.0061 eiders per year; 1 / 0.0061 = 163.93 years. For the upper estimate: 0.04 Alaska-breeding eiders per year x 2.94 increase in risk of vessel strike = 0.12 eiders per year; 1 / 0.12 = 8.33 years). We acknowledge not all risk of vessel strike would lead to actual strikes. However, this estimate captures only the potential increase in vessel activity related to hunting and does not include vessels used for other activities. We do not expect increased risk in strike for Steller's eiders in Kinzarof Lagoon or Cold Bay, since these areas are already accessible to King Cove residents by boat.

Therefore, it is reasonably certain construction of a road along the Izembek Isthmus would increase vessel use in areas used by large numbers of Steller's eiders, increasing injury and mortality risk to Alaska-breeding Steller's eiders through vessel strike. The effects to Alaska-breeding Steller's eiders of increased mortality resulting from vessel collisions in Izembek Lagoon would persist for the foreseeable future.

5.2.3.2 Collisions with Vertical Structures

As stated above, Steller's eiders have a high risk of collision with marine- and land-based infrastructure because of their tendency to fly low and fast over the water (Day et al. 2004). Therefore, we estimate between 0.32 and 2.55 eiders per year collide with vertical structures in the vicinity of the Alaska Peninsula. We estimate that the baseline land-based collision risk for Alaska-breeding Steller's eiders in the project area is extremely low 0.0032 to 0.026 eiders per year, or one eider every 39 to 312 years (see section 4.2.4.6). No permanent vertical structures are being added to the landscape as part of the proposed action. Therefore, the collision risk of the proposed 50-year road is extremely low.

However, temporary mobile lighting would be used during the 3 years of construction, including at barge landing sites. Lighting on equipment would also be used as necessary during construction. Lighting can disorient birds in flight, cause grounding events with numerous birds, and may disturb Steller's eiders on water within critical habitat. This disorientation risk increases the likelihood of collision risk with construction equipment and temporary structures (such as mobile offices). These effects will be minimized by limited through conservation measures, including: limiting the height of temporary lighting structures, using down shielded or directional lighting, and limiting construction timing to daylight hours from November 1 through April 30 (see section 1.5). Thus, we expect collision risk with vertical structures to be low during construction from November 1 to April 30. However, risk of collision would remain higher in the fall (August through October), particularly if/when construction occurs at night.

We assume that collision risk with vertical structures during construction would be relatively low, given the limited use of structures and implementation of conservation measures. Therefore, we estimate eider collision risk with vertical structures is likely toward the lower estimated rate of 0.32 eiders per year during the construction period. We assume that any eider that collides with a vertical structure could be from the Alaska-breeding population. Therefore, we estimate up to one Alaska-breeding Steller's eider collision with vertical structures over the 3-year construction period due to the effect of the action (0.32 eider collisions per year x 3 years = 1 eider per year; see 4.2.4.6 for calculation of baseline eider collision rates). There are currently no proposed plans for other vertical infrastructure along the road, therefore we do not consider an increase in the number of vertical structures (beyond construction) to be reasonably certain to occur.

5.2.4 Habitat Loss and Degradation

Construction of the road embankment would result in the loss of approximately 161 ac (65.2 ha) of undisturbed fish and wildlife habitat along the Izembek Isthmus, plus 22 ac (8.9 ha) of lands with some level of existing anthropogenic disturbance (e.g., related to trails;(ADOT&PF 2026*b*). The road would also cross multiple streams and wetlands, with plans for installation of 93 drainage structures. Disruption to surface and subsurface flows are expected. Disruption of surface water flow in uplands would impact both surface and subsurface flows, with the latter being an equally important component of wetland hydrology because groundwater may be the primary source of water in a lowland wetland. Water for construction and future maintenance would be derived from local sources and would have additional effects. Construction of roadways in pristine (i.e., undisturbed) landscapes causes an abrupt step-change in ecosystems by providing a conduit for people, plants, animals, pathogens, contaminants, and off-road access (Povoroznyuk et al. 2022).

Roads change the physical conditions on and adjacent to the road embankment, and these changes have consequences that persist beyond the period of construction (Trombulak and Frissell 2000). A review of 58 publications that assessed the spatial influence of road impacts (including changes in animal abundance, density and population size; modification in animal behavior; reductions of species richness and diversity, changes of landscape patterns, facilitation of resource extraction and hunting; noise increase) found that 100 percent of these impacts were observed within 0.6 mi (1 km) of the road and 39 percent were observed within 1.2 mi (2 km) of the road (Ibisch et al. 2016). Portions of the proposed road would fall within this distance of areas used by Steller's eiders, with the road ranging from 0.5 to 1 mi (0.8 to 1.6 km) from Kinzarof Lagoon and 0.7 mi (1.1 km) from Izembek Lagoon at the closest point. However, the spatial extent of road impacts varies by road type, traffic volume, surrounding habitat, landscape, terrain features, seasons, weather conditions, and time (Ibisch et al. 2016). While impacts are consistently observed within 0.6 mi (1 km), they are not limited to this distance. The downstream effects of the proposed road to wetland habitats along the Izembek Isthmus may extend beyond this distance, given local hydrology and the interconnectedness of habitats (including the lagoon systems) in the action area.

A new road bisects the landscape, which in turn leads to a bisected distribution of snow and water flow patterns, modifying the hydrology by changing the connectivity between lands, wetlands, rivers, and lakes (Povoroznyuk et al. 2022) and disrupting surface-water flow (Trombulak and Frissell 2000). Linear infrastructure such as roads has additional hydrological effects including channeling, impeding and intercepting flows, interruption of ephemeral stream flow, and increasing ponding and erosion (Povoroznyuk et al. 2022). Road construction commonly also constrains distributary channels that would otherwise migrate through time, which can lead to channel incisions, diminished habitats, and changes in the plant communities (van Proosdij et al. 2009, Limpinsel et al. 2023). Roads further disrupt the natural environment through impacts to soil density, temperature, soil water content, light, dust, and patterns of run-off and sedimentation (Trombulak and Frissell 2000).

Direct effects on hydrologic resources and processes expected during construction of the proposed road include stream crossings and infill of wetlands along the corridor and exposure of water resources to localized, temporary sediment discharges from disturbance during excavation and construction activities. Indirect effects during construction would include increased sediment load from stream shoreline disturbance and discharge of excavated material during construction of drainage structures, both affecting water quality. Increased sediment loads would continue to move through the system once hydrologic processes are reestablished within each stream (i.e., after construction is complete). Effects from road use and maintenance include increased sediment load from road runoff, pollution from vehicles, and increased ATV use into adjacent areas. Off-road vehicle use through the Izembek Refuge would further impact wetland function in this area (USFWS 2025*a*). Specific effects of sedimentation and turbidity are discussed below, in section 5.2.4.1.

Degradation of habitat, particularly eelgrass, could affect Steller's eider body condition and time spent feeding. Modeled changes to eelgrass habitat in Izembek Lagoon indicated that a more than 70 percent reduction in eelgrass biomass reduced the proportion of brant that emigrated in the fall, and a more than 50 percent reduction in eelgrass biomass reduced winter and spring brant emigration (Stillman et al. 2021). Modeled reductions in eelgrass also led to increased proportion of time feeding to compensate for the loss in abundance. Thus, we expect impacts from road construction and use (e.g., sedimentation, turbidity, altered hydrology) that are large enough to degrade eelgrass would lead to reduced body condition and/or increased energy expenditure on feeding in some Steller's eiders.

In summary, road construction and use would result in permanent ecological change resulting from direct and indirect effects to habitats along the isthmus, which would have cascading effects to adjacent marine areas. These would be minimized to some extent by the agreed upon conservation measures. Previous conclusions by the Service support that a high level of permanent ecological degradation to habitat would occur from the construction of a road through Izembek Refuge (DOI/USFWS 2013*b*). The lagoons on either side of the isthmus are hydrologically connected through surface and subsurface flow (see sections 1.3 and 4.1.1), and changes to water quantity and quality flowing into these lagoons would lead to impacts to habitats and resources used by Steller's eiders. We expect these impacts would have adverse impacts to eelgrass habitat and associated macroinvertebrate prey and therefore have adverse effects to Steller's eiders.

5.2.4.1 Turbidity and Sedimentation

Road construction and maintenance, materials excavation, and increased off-road vehicle use (and resulting impacts to the landscape) would contribute to surface runoff and increase sediment loading and turbidity in the surrounding freshwater and marine environments. Off-road traffic, such as ATVs, would establish routes away from the roadway into adjacent areas of Izembek Refuge, resulting in pioneering trails and damage to habitats along the isthmus (see Figure 29). These routes would cause vegetation loss, soil compaction, erosion, and increase sedimentation into nearby waterbodies. Sedimentation and related effects would be highest during construction and would continue during road maintenance and use and after the road is no longer in service, due to continued ATV use for as long as a gravel structure remained to support such use. There are multiple ways for sediment to mobilize into waterbodies, including through channel erosion and by dust generated from development activities or use of the roadway. Sediment inputs from development activities can impact water quality and reduce the abundance, taxonomic richness, and diversity of aquatic communities.

Fugitive dust from road construction and routine vehicle traffic along roadways is a common source of sediment deposition to the surrounding environment, affecting nearby vegetation and adjacent water sources. Dust reduces vegetation productivity, alters species composition in wetlands, and may eventually flow into nearby waterways. Fugitive dust associated with road construction and use would be expected to spread well beyond the road corridor; the distance is difficult to predict because it depends on factors that include local weather patterns and traffic speeds.

Figure 29. Where road access has made portions of Izembek Refuge accessible, unsanctioned off-road trails and trail scars crisscross the landscape at high density, affecting soils, hydrology, and water quality in the impacted area. Photo credit: Gerrit Vyn.

Freshwater and marine wetlands slow runoff, moderate stream flows, and provide important wildlife habitats, such as nesting and escape cover. For example, eelgrass beds not only provide an abundant macroinvertebrate community, but also provide sheltered (i.e., low wave energy) locations where large flocks of Steller's eider and other waterfowl congregate to rest and find protection from predators in large numbers. These wetland functions are reduced by roads and the associated use of ATVs. We expect riparian areas and wetlands connected with streams that are paralleled or crossed by ATVs would experience a loss of vegetation, bank erosion, a reduction in water quality, and increased transport of sediment to coastal wetlands and eelgrass beds in the action area. Shrub vegetation, coupled with a harsh climate and slow rates of recovery for soils and vegetation, predispose the action area to erosion (DOI/USFWS 2013*a*); this, combined with impacts from the road and ATV use would result in immediate degradation of wetland habitats, including those used by eiders. Degradation would persist as long as overland ATV use and scars from this ATV use continue.

Seagrasses are important primary producers in nearshore environments (Ramus 1992, Waycott et al. 2009, Barbier et al. 2011, Murphy et al. 2021) that can be impacted indirectly when sediment is delivered by streams and rivers into the marine environment. Eelgrass is critical to the ecological community present in Izembek Lagoon and nearshore areas of Kinzarof Lagoon and Cold Bay; it provides food, habitat, and key ecological services (Murphy et al. 2000, Orth et al. 2006, Tippery 2013, Limpinsel et al. 2023). Steller's eiders depend on the eelgrass beds of the Izembek Complex as a source of abundant, high-quality prey (see section 5.3).

Eelgrass is the dominant seagrass in Alaska (Limpinsel et al. 2023). However, eelgrass communities like those found in Izembek Lagoon have been on the decline (Keser et al. 2003, Pihl et al. 2006), largely as a result of development activities (Orth et al. 2006, Boudouresque et al. 2009). Die-offs in affected seagrass areas are known to occur when development activities increase sedimentation and cause a subsequent increase in phytoplankton blooms (Hauxwell et al. 2003, Lotze et al. 2006). Additionally, increases in turbidity can deprive seagrass communities of available light, inhibiting leaf growth and increasing seagrass mortality (Moore et al. 1997, Longstaff and Dennison 1999, Terrados et al. 1999, Zabarte-Maeztu et al. 2020, Picard et al. 2022). The biodiversity and abundance within ecosystems become impaired as eelgrass is lost (Reed and Hovel 2006).

Macroinvertebrates, which serve as a bridge between trophic levels and are crucial components of aquatic ecosystems, are also impacted by sedimentation and other changes to water quality. We expect displaced sediment, resulting from road construction and maintenance and consequent overland ATV use on the Izembek Isthmus, would impact water quality, negatively affecting the benthic macroinvertebrate prey species Steller's eiders rely on. Some macroinvertebrates prefer specific substrate types and are sensitive to the accumulation of fine sediments on the bottom surface (Burdon et al. 2013, Bylak and Kukuła 2022). Suspended sediments can also affect filtration systems and other vulnerable body parts, and normal function is disrupted when individuals change behavioral responses to avoid damage and protect themselves (Jones et al. 2012). Macroinvertebrates may also detach from the substrate and drift downstream, and this behavioral response to unsuitable conditions can increase when suspended sediments are abundant (Culp et al. 1986, Doeg and Milledge 1991, Bylak and Kukuła 2022). Steller's eiders are thought to exist at the edge of their energetic range (Goudie and Ankney 1986), making them sensitive to habitat changes that affect their local food resources.

Physical and behavioral effects to macroinvertebrate prey from increased sedimentation and reduced water quality would result in shifts in the quantity, quality, and distribution of Steller's eider prey and would lead to Steller's eiders expending more energy while foraging in the Izembek Complex, including if they are forced to forage more hours or travel farther in search of prey. Prey distribution shifts in the Izembek Complex would lead to shifts in Steller's eider site use. Such shifts would be temporary in response to most construction activities; but the road itself would be a permanent feature on the landscape, and effects related to changes in local hydrology (e.g., through water impoundment or channel incision) or runoff would exist for the life of the road. Similarly, effects related to road maintenance and use (e.g., fugitive dust) and overland incursions by ATV use would be long-term. The amount and scale of effects to prey species would depend on the magnitude of sedimentation to the lagoons.

While we can be reasonably certain sedimentation and turbidity would increase in local area streams and wetlands (as a result of road construction, maintenance, and use, and ATV use), the rate of increase and the magnitude of sediment loading into the environment (including Izembek and Kinzarof Lagoons) are hard to predict. Downstream effects would be largest in streams where upstream disturbance is the greatest (e.g., in areas of bridge construction, culvert installation, or material site excavation). Large sediment loads in streams with high flow rates, which transport more sediment, would be deposited in the nearshore environment of the connected lagoon or bay, and would affect areas where Steller's eiders forage and seek refuge. Effects from sedimentation during construction would be minimized to a certain extent, given the road would have to meet general construction requirements, including a Stormwater Pollution Prevention Plan (SWPPP).

Preliminary design of the proposed road has identified 94 drainage structures (1 bridge and 93 culverts, see 1.4.1) that would be required. The bridge would be built over Southeast Kinzarof Stream (Anadromous Waters Catalog #283-34-10700; ADF&G 2024). Based on a preliminary proposed route, the road would cross four other streams that are currently identified as anadromous (Anadromous Waters Catalog #s 283-34-10600, 283-34-10500, 283-34-10500-2031, 283-34-10430; ADF&G 2024). Design of crossings over fish-bearing streams for fish passage design would follow the Memorandum of Agreement between Alaska Department of Fish and Game and ADOT&PF for the Design, Permitting, and Construction of Culverts for Fish Passage (ADF&G and ADOT&PF 2025, ADOT&PF 2026*b*) and the Service's Culvert Design Guidelines for Ecological Function (Revision 10, 2025), which will help reduce sedimentation during construction and maintain connectivity for fish passage. ADOT&PF will retain natural vegetation and minimize use of riprap in all stream crossings which will also help reduce bank erosion and sedimentation (per 1.5 Conservation Measures).

Sedimentation resulting from road use and increased overland ATV travel would be harder to minimize but is also difficult to quantify. However, we calculated a reasonable increase in trails related to ATV transgressions into Izembek Refuge that we might expect with additional miles of road constructed. We assume the rate of increase of trails (seven times existing levels) would approximate the increase in magnitude of erosion and sedimentation into surrounding waterbodies from ongoing ATV use.

In summary, we expect some level of increased sedimentation and turbidity likely in the action area. We estimate a sevenfold increase in sedimentation from increased ATV use alone. Where such increases in sedimentation enter the marine environment, eelgrass growth would be impaired and prey species Steller's eiders depend on would be affected. The impacts of sedimentation and turbidity resulting from the proposed road would be additive to existing stressors on eelgrass habitat and macroinvertebrate prey within the Izembek Complex (see 3.1.4.3 and 3.1.4.10). We anticipate the proposed conservation measures (i.e., the SWPPP and Culvert Design Guidelines for Ecological Function) will reduce the potential for sedimentation (only during road construction); however, given the impacts that have already been documented from increased off-road vehicle use associated with the 17.2-mi (27.7-km) King Cove extension road (e.g., Figure 28; see section 4.1.7), the anticipated additional increase in off-road vehicle traffic, and the anticipated ongoing use of the proposed road, we expect adverse impacts to nearby eelgrass habitat and associated macroinvertebrate prey as a result of the direct and indirect effects of the action. We expect degradation of habitats to impact some Steller's eiders by increasing energy expenditure on feeding (e.g., more time spent feeding or more effort to find high-quality prey) and potentially reduced body condition.

5.2.5 Environmental Contaminants

The use of heavy equipment during construction or maintenance, increased vessel traffic during and after road construction, and increased vehicular traffic (i.e., road vehicles, ATVs, and snowmachines along the road corridor or along the isthmus in Izembek Refuge) would increase the risk of hazardous materials release to the environment. It is likely some amount of hazardous materials release would occur, through accidental fuel and oil spills. Large spills of petroleum hydrocarbons or other contaminants are not reasonably certain to occur because there is low risk the project would result in a large spill, but there is a high probability small spills would occur periodically, during or after construction. Heavy equipment would be used during construction and maintenance; after construction, motorized vehicles would use the road for the life of the road.

Additionally, we expect an increase in vessel traffic in the action area. Small spills associated with leaking equipment are common with the use of motorized vehicles and heavy equipment, and accidental spills are also common occurrences (including during emergencies and refueling). Some number of small spills to the roadway or off-road environment would persist; when the source of a spill is not known (often the case with accidental spills), there may not be a responsible party to be liable for containment and cleanup or the costs associated with the containment, cleanup, and damages resulting from the spill. Effects of hazardous materials release will be minimized by responsible parties (including ADOT&PF and their contractors and Aleutians East Borough) during road construction and maintenance, in part, through the development and use of best management practices and policies in hazardous material and spill plans (see conservation measure 14). The road would also have to meet general construction requirements from the State, including a SWPPP, which will reduce the risk of contaminants entering the marine environment through stormwater runoff.

Contaminants entering marine environments, including through post-construction stormwater runoff or snowmelt or through direct spills during off-road and on-water activities, would impair water quality, thereby adversely affecting Steller’s eiders and their habitat and prey resources. Where smaller spills of petroleum and petroleum products have occurred, Steller’s eider habitat quality has been impacted at a small scale (USFWS 2025*b*). Pathways of effect to individual Steller’s eiders involve direct contact with contaminants in the abiotic environment (USFWS 2025*b*) or ingestion of contaminated prey items (Franson 2015). Direct exposure to petroleum hydrocarbons affects an individual eider’s ability to thermoregulate, and polyaromatic hydrocarbons are toxic to individual eiders if ingested during preening or by consumption of contaminated prey (USFWS 2025*b*). Effects from spills and pollution to Steller’s eider habitat and prey are discussed in section 5.3.2.

In summary, small spills of hazardous materials during road construction, maintenance, and use and during off-road or on-water travel are likely. Spills would have detrimental impacts to Steller’s eider habitat and prey species. While Steller’s eiders are vulnerable to the effects of oil spills and other sources of contamination at an individual and population level (depending on variables such as size and location of the spill), we expect few listed eiders would encounter spilled contaminants as an effect of the proposed action because: 1) most spills are preventable and 2) if accidental spills occurred, they would most likely be of low volume and localized. A contaminants spill in important and/or high-use areas would be expected to encounter some number of individual Steller's eiders and would result in substantial impacts to Steller's eiders at the population level if the spill occurred during (or persisted into) times of the year high numbers of Steller's eiders are present and/or if prey resources became contaminated. Large contaminants spills are not expected to occur consequent to the proposed action. Small spills, which are considered likely to occur, are expected to remain localized and affect, at most, only a few eiders or a small area containing prey resources. Small spills would therefore not be expected to have a population-level effect.

Increased hunting and fishing activities along the Izembek Isthmus and in Izembek Lagoon may also result in the deposition of lead shot or lead fishing sinkers into wetland and marine habitats. Lead introduced into these habitats can remain accessible to Steller's eiders for the long-term (Franson et al. 1995, Flint and Schamber 2010). The effect of exposure to lead, including lead from shot, varies; but lethal and sublethal response can occur in Steller's eiders (Hoffman 1990, USFWS 2025*b*). While increased hunting of waterfowl or other wildlife could result in some increase in lead loading to the local area, use of lead shot for waterfowl hunting is prohibited nationwide, and in Alaska use of lead shot is prohibited for hunting of all migratory game bird species and overall appears to be declining. Lead shot does not appear to be sold in Cold Bay presently. It is unknown whether any type of ammunition is sold locally in King Cove or whether residents purchase their ammunition elsewhere (M. Fosado, USFWS, pers. comm. 2025). At this time, we have no information with which to assess the likelihood that use of lead shot occurs and would increase during hunting activities at Izembek Lagoon and along the isthmus. Lead fishing sinkers are widely used in Alaska, and their use during recreational or subsistence fishing would also contribute to lead loading in the marine environment. If exposure of Alaska-breeding eiders to lead increases through increased hunting and fishing activities, we expect there would be significant, negative effects to individual fitness and to the resiliency of the Alaska-breeding population (USFWS 2025*b*). However, effects would depend on background lead levels in the action area and the rate of increase, which are both unknown. Therefore, it is not reasonably certain that lead would be deposited as an indirect effect of the proposed action in or near Steller's eider habitat at rates sufficient to impact listed eiders.

Roads can also lead to chemical changes to the surrounding environment, mainly through introducing heavy metals, salt, organic materials, ozone, and nutrients (Trombulak and Frissell 2000). While studies indicate contamination declines within 65.6 ft (20 m) of the road, elevated levels of heavy metals often occur 656 ft (200 m) or more from the road (Trombulak and Frissell 2000). It has been demonstrated that when these metals reach aquatic environment the transportation rates increase (Gjessing et al. 1984), which is relevant and concerning in a wetland system such as Izembek Refuge. Once fixed to soils, metals and other persistent chemicals can be transported to aquatic systems by wind, water, or gravity (Trombulak and Frissell 2000). Road dust is a common vector for chemical transport. In a subarctic lake system in Canada, lakes 0.62 mi (1 km) from the highway were chemically distinct (higher calcium and conductivity) from lakes greater distances away (Zhu et al. 2019). The proposed road would be a single lane gravel road. Preliminary estimates suggest the average daily traffic would be less than 50 vehicles. Chemical changes to the surrounding environment are reasonably certain to occur, as indicated by previous research. However, due to the limited volume of traffic combined with the distance to the aquatic environments used by Steller's eiders, we expect the impact of chemicals from the road affecting Steller's eiders would be small although accumulation over the life of the road would increase exposure over time.

5.2.6 Other Sources of Mortality

We considered the potential for the action to increase effects to Steller's eiders through other sources of mortality. In order to treat these sources as indirect effects in the biological opinion, they must be reasonably certain to occur, as evidenced by appropriations, work plans, permits issued, or budgeting; they follow a pattern of activity undertaken by the agency in the action area; or they are a logical extension of the proposed action. We dismissed the following as not reasonably certain to occur as a consequence of the proposed action: increased rate of collisions with elevated infrastructure or vehicles, increased rate of incidental fisheries bycatch, and increased effects from trash entering the marine environment (e.g., entanglement with fishing line, increased predation risk as a result of predator attraction).

Construction of a road to connect the communities of King Cove and Cold Bay could lead to other development along the road corridor, including of elevated/vertical infrastructure such as telecommunication lines, power transmission lines, and towers. Steller's eiders have been injured and killed in collisions with this type of infrastructure, including in and near the action area. Overhead transmission lines may be especially risky (USFWS 2025*b*). Overhead lines constructed in coastal environments are known to cause mortality of Steller's eiders on the Alaska Peninsula (USFWS/Russell 2004); and elsewhere, overhead lines constructed on a marine isthmus were specifically documented as high risk to Steller's eiders (Øien and Aarvak 2007).

The isthmus is presently free of elevated infrastructure and artificial lighting, including lighting related to vehicle traffic. Steller's eiders shift across the isthmus between Izembek and Kinzarof Lagoons, particularly during storm events, in part because these waterbodies experience opposite prevailing winds and distinct tidal cycles. Steller's eiders wintering in Izembek Lagoon are also known to move across the isthmus to Kinzarof Lagoon and Cold Bay to maintain access to prey resources when Izembek Lagoon experiences icing conditions (USFWS/Trust et al. 1997, Laubhan and Metzner 1999). In addition, Steller's eiders may move between primary wintering sites and secondary wintering sites and have been documented moving between sites along the southeastern coast of the Alaska Peninsula and sites along the Bristol Bay coast of the Alaska Peninsula, including Izembek Lagoon (Martin et al. 2015). This transition between sites would include low-level flights across the isthmus, during periods of poor weather and reduced natural light conditions that result in reduced visibility of elevated infrastructure. Any artificial light along the isthmus – including lighted infrastructure and headlights associated with vehicular traffic – would be a measurable change in this light-free location. Birds using the Izembek Complex are assumed not to be habituated to artificial lights. Although there is potential for additional infrastructure development to occur with improved access, we cannot be reasonably certain this development would occur as an indirect effect of the road because there are no proposals for any such development currently; permanent vertical structures and permanent lighting are not incorporated into the proposed road project. Vehicle traffic is expected to be low volume (USFWS 2025*a*) and therefore would not be a continuous source of potential attraction. We also lack evidence that Steller's eiders are at risk of striking vehicles during overland flights. Therefore, we do not anticipate a significant risk of collisions with vertical structures or vehicles using a future road.

We considered whether the seafood processing plant in King Cove would re-open as a consequence of the construction of the road and whether its possible re-opening was reasonably certain to occur; we conclude that neither circumstance applies. While the economic viability of the seafood processing facility would improve with a road in place to transport seafood from King Cove to Cold Bay, there is insufficient indicia that the construction of the road would make it reasonably certain that the seafood processing plant would re-open. There are a number of other factors that would determine whether it was cost-effective to re-open the plant including the market, labor costs, etc. King Cove has been trying to attract a buyer since the plant closed in 2024 and there is no indication of a buyer of the plant. Because there are no stated plans to reopen the seafood processing plant, we conclude it is not reasonably certain to occur and do not consider reopening an indirect effect of the action.

Construction of the road is expected to result in general increased use of the Izembek Isthmus for recreation (hiking, bird watching and other wildlife viewing, etc.) and subsistence (berry-picking, etc.). These actions, singly or in combination, are not expected to contribute to meaningful disturbance to Steller's eiders or increased levels of contaminants and pollution entering the nearby environment; therefore, we conclude any such effects are discountable or insignificant and do not rise to the level of adverse effects.

The ADF&G allows fishing within Izembek Lagoon, including commercial salmon seining, as well as drift gillnet salmon fishing offshore of the barrier islands (see section 4.1.6 for discussion of the current environmental baseline related to fishing activities). Subsistence fishing is also allowed within the lagoon, including set gillnet fishing. Salmon gillnet fishing has a documented high risk of entangling and drowning marine birds like Steller's eiders; however, gillnet fishing is limited to areas outside of the barrier islands. Based on data from 2023 and 2024, there are only four or five operators conducting salmon seining in Izembek Lagoon. If road access leads to increased fishing activities within Izembek Lagoon, which could include additional salmon seining, exposure of Steller's eiders to this risk would increase. We expect that improved access to Izembek Lagoon would result in increased use by residents from King Cove. However, current facilities providing vessel access to Izembek Lagoon are limited to an unimproved public boat launch. We do not expect the construction of a road would result in a significant increase in commercial use of Izembek Lagoon, with the anticipated increase in fishing activity mainly expected to be from residential/sport fishing. We do not expect this change in commercial fishing to result in meaningful impacts to Steller's eiders beyond the vessel-caused disturbance previously analyzed in section 5.2.3.

Increased fishing and other human activity within Izembek Lagoon and along the isthmus would also increase the potential for trash to accumulate in the local environment and enter the marine environment, including from the roadway and vessels using the lagoons and bay due to the typically windy conditions in this region. Direct effects to Steller's eiders may include ingestion and entanglement (e.g., with fishing line). Predator attraction to the local area through improper disposal of trash, including carcasses of fish and wildlife, would increase predation risk to individual Steller's eiders. In areas where Steller's eiders are attracted to prey or other resources, elevated predator communities effectively become an ecological trap (Reed and Flint 2007), with noticeable consequences at the population level. Human activity has occurred in the Izembek Complex for decades. There is no evidence that trash is currently affecting Steller's eiders in the action area. While we cannot characterize the level of trash that would enter the environment, we expect the level of trash entering the system from road use to be small because the road is a single lane at least 0.5 mi (0.8 km) from the lagoons at the closest points and is expected to receive a relatively low volume of traffic, given the small size of the two connected communities. In the aquatic environments of the Izembek Complex, both human use and eider presence are dispersed throughout the large area; any introduced trash has a small likelihood of overlapping areas used by eiders. Therefore, although the proposed action is likely to result in increased human activity, which in turn is expected to result in an increase in trash being introduced to the environment, we have no evidence to indicate that adverse effects to Steller's eiders from trash are a reasonably certain to occur effect of the action; we conclude the likelihood of adverse effect is discountable and therefore it is not an indirect effect of the action.

5.2.7 Effects on Recovery

The ESA requires a recovery plan to incorporate, to the maximum extent practicable, "objective, measurable criteria which, when met, would result in a determination, in accordance with the provisions of this section, that the species be removed from the list [of endangered and threatened wildlife]…" (16 USC 1533(f)(1)(B)(ii)). The 2021 recovery plan for Alaska-breeding Steller's eider identifies criteria that, when met, indicate the point at which reclassification under the ESA should be considered. It includes abundance and population trend criteria for the Pacific-wintering population of Steller's eiders and population threshold criteria for the Alaska-breeding Steller's eiders and Pacific-wintering Steller's eiders (i.e., a minimum number that should be present on Alaska's Arctic Coastal Plain nesting area over a 20-year period; USFWS 2021*a*). The recovery plan also requires population-level threats must not detract from the demographic criteria and identifies some of these threats: threats include but are not limited to ingestion of lead ammunition, mortality from shooting, and bird collisions with human infrastructure (USFWS 2021*a*). The recovery plan notes some threats, such as disturbance, can be affected by management actions; other threats may not be under our direct control, and the plan specifies management actions that should be taken to reduce threats (USFWS 2021*a*).

The demographic criteria for recovery of Alaska-breeding Steller's eiders require that the minimum number of Alaska-breeding Steller's eiders present in the nesting area be maintained or increased over the long-term, compared to the numbers observed over the past 30 years. The recovery plan requires the number of breeding Steller's eiders in Alaska, and our confidence in that number, should be higher if the abundance and trend of the Pacific-wintering population of Steller's eiders is unknown or if the trend is known to be decreasing. The recovery criteria for Alaska-breeding Steller's eiders were previously described in section 3.1.5. The Alaska-breeding population is estimated as a mean of 406 total individuals (95 percent CI = 207.67 – 750.02, over the period 2007 to 2024), and the population size and trend of the Pacific-wintering population of Steller's eiders is currently unknown (see section 3.1.3).

Direct injury and mortality of some Alaska-breeding Steller's eiders is expected, primarily resulting from activities facilitated by increased access to Izembek Lagoon, which will increase risk of exposure to known threats identified in the recovery plan (including harvest and vessel collisions; see sections 5.2.2 and 5.2.3). We expect an increase in the risk of vessel strike to Steller's eiders within Izembek Lagoon would result in up to one Alaska-breeding Steller's eiders removed from the population every 8.33 to 164 years over the life of the road (or up to 6 birds over 50 years). We expect an increase in the risk of inadvertent harvest of Steller's eiders during waterfowl hunting in Izembek Lagoon, equating to one Alaska-breeding Steller's eider harvested every 10 to 11 years, for the foreseeable future (i.e., over the life of the road and decades beyond). This equates to approximately 5 birds over 50 years. Assuming there are approximately 406 Alaska-breeding Steller's eiders, this would represent a loss of only a fraction of 1 percent (i.e., less than 1 percent) of the population every decade. We also estimate a small increase in the risk of collisions with vertical structures during the 3-year construction window, resulting in one bird removed from the population. The recovery plan specifies management actions should increase or maintain the rate of adult survival, including by reducing shooting mortality (management action 1) and by reducing collisions with vessels (management action 4; USFWS 2021*a*). Although the action considered herein would not contribute positively toward recovery goals, we do not anticipate the annual, direct loss of Steller's eiders consequent to this action would result in a noticeable reduction in the numbers of Alaska-breeding Steller's eiders present on the Arctic Coastal Plain.

In summary, we would not anticipate measurable population impacts from the loss of 12 individual Alaska-breeding Steller's eiders (from collisions with vessels and inadvertent harvest) over the projected 50-year life of the road.

5.3 Designated Critical Habitat for Steller's Eider

The proposed road construction and maintenance would occur near an important, high-density Steller's eider concentration area that is designated as critical habitat (Unit 5: Izembek Lagoon). The Izembek Lagoon critical habitat unit was designated due to its importance for molting, wintering, and staging (see sections 3.2 and 4.3). This critical habitat unit includes all waters of Izembek Lagoon, Moffett Lagoon, Applegate Cove, and Norma Bay, and waters 0.25 mi (400 m) offshore of the Kudiakof Islands and adjacent mainland. The PCEs identified for Izembek Lagoon include 1) marine waters up to 30 ft (9 m) deep and the underlying substrate, 2) the associated invertebrate fauna in the water column, 3) the underlying marine benthic community, and 4) where present, eelgrass beds and associated flora and fauna.

This effects discussion evaluates direct and indirect effects to Steller's eider critical habitat from the construction, maintenance, and use of a new road through Izembek Refuge to connect the communities of King Cove and Cold Bay. We also consider activities that would occur in Izembek Lagoon and on the Izembek Isthmus consequent to the new road (i.e., interrelated and interdependent actions).

5.3.1 Turbidity and Sedimentation

In-stream work during construction, including pile driving and culvert placement, would increase turbidity in the immediate project area and affect downstream waterbodies through connected waterways and surface water sheetflow. Construction, maintenance, and use of the road, which includes activities like excavation, would also increase sediment loading to the surrounding freshwater and marine environments. Sedimentation and turbidity are expected to be mostly temporary and localized during construction activities (especially with the implementation of a SWPPP), but any downstream effects that reach the lagoon system would result in changes to water quality and the condition (e.g., size, quality, abundance) of benthic macroinvertebrate prey by decreasing sunlight important to health of their host habitat (eelgrass) or through physical influence of particulate matter on the macroinvertebrates themselves (Longstaff and Dennison 1999, Gorgula and Connell 2004, Watanabe et al. 2016, Picard et al. 2022). If reductions in prey condition are large enough, this would lead to reduced nutritional or energetic value of prey available to Steller's eiders in at least portions of the Izembek Lagoon critical habitat unit. Sedimentation would impact a small portion of Steller's eider designated critical habitat, specifically PCEs closest to the shoreline and to areas where streams discharge into the lagoons. Therefore, we expect eelgrass beds and macroinvertebrates in areas closest to where freshwater streams discharge into Izembek Lagoon would experience some reduction in quality and/or quantity during construction of the road, but these effects to Steller's eider critical habitat PCEs would be localized and temporary.

Road use and maintenance and subsequent activities associated with increased access, such as off-road use of ATVs, would also contribute to sedimentation and turbidity following construction and would persist for the life of the road (and ATV-caused effects would presumably persist well beyond this). See sections 5.2.4 and 5.2.4.1 for discussion on the effects of sediment inputs from development activities on Steller's eider prey and habitat that correspond to critical habitat PCEs (i.e., marine waters and benthic substrate in nearshore habitats, prey species in the water column and in the benthos, and eelgrass beds and their associated flora and fauna). The downstream effects of turbidity and sedimentation related to road use and associated activities would continue for the life of the road (projected to be 50 years) but are expected to be localized, impacting a small portion of Steller's eider designated critical habitat, specifically PCEs closest to the shoreline and to areas where streams discharge into the lagoons. We expect impacts would affect marine waters and eelgrass beds or macroinvertebrate prey closest to where freshwater streams meet the lagoon, and they would experience reduced quantity and/or quality where degraded instream inputs occur.

We calculated the increase in ATV-caused trails we expect would result from transgressions onto the isthmus with a substantial increase in miles of road constructed (see section 5.3.1) and considered this as a proxy for one source of increased sedimentation and turbidity. We estimated the increase in extent of off-road vehicle traffic would be sevenfold: following construction of the 17.2-mi (27.7-km) King Cove extension, the Refuge documented an increase in off-road vehicular trails of 123.5 mi (198.7 km). The King Cove extension would connect with the proposed new road. Using the King Cove extension and its associated network of unsanctioned trails as a surrogate, we estimate 7.18 mi (11 km) of new, off-road vehicular trails would be expected per new 1 mi section (1.6 km) of proposed road. Because 5.6 mi (9 km) of the new road would be built on existing trails and roads, we do not expect that portion to experience a large change in off-road vehicle use. We therefore anticipate approximately 95.5 mi (153.7 km) of new off-road vehicular trails will impact the Izembek Isthmus with construction of 13.3 mi (21.4 km) of road in areas without current roads or trails, assuming similar patterns of access, terrain, and enforcement. ATV use and other off-road vehicular travel have been demonstrated to cause increased erosion and sedimentation. These effects are reasonably certain to reduce the quantity and/or quality of marine invertebrates, marine benthic communities, and eelgrass habitat where degraded instream inputs occur, although we do not have the data available to determine the magnitude of these impacts.

We lack data to calculate the specific area of critical habitat that would experience increased sedimentation and turbidity and the magnitude of this effect (e.g., how much eelgrass would be lost or the area over which eelgrass blade density would decrease and by how much and the extent to which macroinvertebrate biomass would decrease). However, we expect the proportion of affected critical habitat to be small, because these effects would only occur in the portions of the nearshore environment receiving freshwater inputs. Adverse effects would persist for the life of the road and beyond and would be additive to other current and ongoing stressors (such as reduction in prey species biomass and loss of eelgrass in Izembek Lagoon; see 4.3). A decrease in quantity and quality of eelgrass habitat and macroinvertebrate prey would be expected in a localized area of this critical habitat unit, closest to areas where freshwater streams enter the lagoon.

5.3.2 Accidental Spills and other Environmental Contaminants

The use of heavy equipment during construction and the subsequent increase in vessel traffic and vehicle traffic (on and off the roadway) would increase the risk of accidental fuel and oil spills, with direct and indirect effects to Steller’s eider critical habitat. Contaminants and petroleum hydrocarbons that enter the marine environment would impact prey resources, eelgrass, and other physical habitat features they contact. Oil can be toxic to invertebrates or impact them through smothering or by altering feeding rates or shell formation (USFWS 2004*b*). Invertebrates may accumulate high levels of contaminants that can be passed on to predators, such as Steller’s eiders. Marine plants respond variably to oiling, but spills may lead to die-offs for some species. Oil can prevent the germination and growth of marine plants, but most vegetation appears to recover after cleanup (USFWS 2004*b*). Response and cleanup activities can also create habitat damage, including through mechanical impacts to benthic substrates or additions of chemical treatments (e.g., dispersants). Oil can remain in the environment long after a spill event, in the subsurface sediments under gravel shorelines and in soft substrates, affecting nearshore habitats longer than pelagic or offshore habitats.

There is a low risk the project would result in a large spill of petroleum hydrocarbons or other contaminants. The risk of small spills would be low during road construction, and implementation of a SWPPP will reduce the risk of contaminants entering the environment through stormwater runoff. The risk of small spills would be minimized by responsible parties (including ADOT&PF and their contractors and Aleutians East Borough) during road construction and maintenance, in part, through the development and use of best management practice and policies in hazardous material and spill plans (see conservation measure 14).

There is a high probability of small spills during road use and related off-road and on-water activities. Eelgrass that is exposed to spills may experience die-offs in localized habitat patches at a small scale. Oil spills would affect any macroinvertebrates (prey species for Steller's eiders) directly encountered, through toxicity or physical effects, or indirectly through effects to the habitats and substrates on which macroinvertebrates rely. Oil can remain in the environment long after a spill event, in the subsurface sediments under gravel shorelines and in soft substrates, affecting nearshore habitats longer than pelagic or offshore habitats. Most vegetation affected by oil spills would be expected to recover after some amount of time, and most macroinvertebrate communities would subsequently also recover (although we would expect the permanent loss of some individuals). It is difficult to characterize small, accidental spills and the rates at which they would occur or to measure the likely magnitude of effect, given this effect would be patchy and would therefore depend on several unknown variables. However, the risk of small spills would persist for the foreseeable future.

5.3.3 Habitat Loss and Degradation

No direct loss of Steller's eider critical habitat is expected through placement of fill for construction of the road embankment. However, construction of the road embankment and its associated activities (e.g., pile driving for a stream crossing, material site development, use of local water sources for compaction) would indirectly alter habitat in the action area through disruption to surface and subsurface flows (see section 5.2.4 for discussion on how roads alter landscapes). Ongoing maintenance and use of the road, and activities made possible by presence of the road (e.g., increased off-road ATV use), would result in permanent ecological change along the Izembek Isthmus, causing indirect effects to the connected lagoon system and changes to eelgrass beds and prey species. These effects would be primarily related to changes in water quality through sedimentation and turbidity, and to a lesser extent through contamination caused by accidental spills and runoff. See sections 5.2.4.1 and 5.3.1 for discussion on the expected effects of turbidity and sedimentation related to road construction and use.

We lack data to calculate the specific area of critical habitat that would experience increased sedimentation and turbidity and the magnitude of this effect (e.g., how much eelgrass would be lost or the area over which eelgrass blade density would decrease and by how much and the extent to which macroinvertebrate biomass would decrease). However, we expect the proportion of affected critical habitat to be small, because these effects would only occur in the portions of the nearshore environment receiving freshwater inputs. Therefore, a decrease in quantity and quality of eelgrass habitat and macroinvertebrate prey would be expected only in a localized area of this critical habitat unit, closest to areas where freshwater streams enter the lagoon. It is not possible to measure the degree to which eelgrass and macroinvertebrate prey would be impacted by accidental spills of unknown quantity and location. Any spills that do occur are expected to be small, which minimizes the expected magnitude of any effects.

Changes are already occurring in Izembek Lagoon (see sections 3.2 and 4.3) and have resulted in impacts to PCEs: over the period 2006 to 2020 there was a net loss in spatial extent of eelgrass approximately 10 mi^2 (25 km^2) of eelgrass (Douglas et al. 2025). and an apparent reduction in the total biomass and size of certain macroinvertebrates on which Steller's eiders rely (based on prey samples in 2019 compared to 1998; Maliguine et al. 2025). Construction, road use and maintenance, ATV-related impacts, and other activities that cause increased sediment loading or introduce contaminants to the lagoon and impact eelgrass and macroinvertebrate would be additive to existing stressors that are not currently well understood. We expect these additive effects to be limited to the nearshore portions of the Izembek complex, where freshwater inputs occur; these affected areas amount to only a small fraction of the total area of designated critical habitat.

5.4 Southwest DPS of Northern Sea Otters

Northern sea otters do not regularly use terrestrial habitats. They occur in nearshore and estuarine environments adjacent to the proposed road and occasionally may come ashore to rest or escape predators. We do expect consequences to sea otters and their habitat from the effects of the action which include activities resulting from construction, maintenance, and use of a new road along the Izembek Isthmus to connect the communities of King Cove and Cold Bay (see Section 1.4).

5.4.1 Disturbance

Sea otters have a high resting metabolic rate to supplement thermoregulation and keep warm because they lack a layer of blubber (a thick layer of fat under the skin) and depend only on their fur. This combination results in high rates of heat loss and low capacity for energy storage, and thus high energetic costs to maintain body temperature. Sea otter resting metabolic rates are about three times greater than predicted for their size. This means sea otters must eat approximately 20 to 25 percent of their body weight each day (Davis et al. 1988). To meet these demands, sea otters spend up to 45 percent of their time feeding and much of the rest of their time resting to reduce energy costs (Yeates et al. 2007, Thometz et al 2014). Disturbances disrupt normal behaviors which impact a sea otter's energetic balance. This can occur in one of three primary ways – causing a response in a previously resting sea otter (e.g., a resting sea otter dives), altering the behavior of an active sea otter (e.g., a foraging sea otter moves from a preferred foraging site), and secondary effects (e.g., increased foraging at a later time, multiple disturbance events, or other consequences from the initial sea otter reaction). Energetic costs of human disturbance to adult sea otters are estimated to range from 3.9 percent to 7.2 percent for one day (Barrett et al. 2025). These estimates were calculated based on southern sea otter behavior in California and depended upon numerous factors. However, these estimates indicate cumulative energy expense over time would likely be substantial for affected individuals, with health consequences especially for an already energy-stressed sea otter.

Fitness and energetic consequences of human disturbance are important at the individual level. Whether these effects translate into population level impacts is less clear and depends on the scale at which disturbance occurs and the extent of any secondary effects on animals in undisturbed areas (Gill 2007). For example, in cases where animals respond to increased human presence by redistributing to new locations, the impact on the population will depend on whether the increased densities at these new sites result in reduced individual survival or fecundity (Gill 2007).

5.4.1.1 Construction and Road Use

Road construction, road maintenance, and road use would increase noise levels. In-air noise generated from construction, pile driving, or other loud activities would impact sea otters. The road from the Northeast Terminal across the Izembek isthmus would range from 0.5 to 1 mi (0.8 to 1.6 km) from Kinzarof Lagoon, 0.7 mi (1.1 km) from Izembek Lagoon at the closest point, and 1.7 mi (2.7 km) from Moffet Lagoon at the closest point. Basic sound analysis estimated that noise from most construction equipment would be just above the background noise levels before reaching areas used by sea otters (USACE 2003, ADOT&PF 2020, 2026*b*). Pile driving associated with bridge construction over Southeast Kinzarof stream is expected to exceed ambient noise levels. Detonation of unexploded ordnances would also exceed ambient noise levels and likely have similar noise impacts as a gunshot; however, given lack of certainty in encountering one, we do not consider this activity qualifies as an indirect effect of the action.

After construction of the road, there would be an increase in noise levels to the surrounding environment from the road throughout the year, depending on weather conditions, types and speeds of vehicles, and other factors. Increased vessel traffic in Izembek Lagoon after road construction would also increase noise levels in the action area, both in-air and in-water. Sea otters can become habituated to noise quickly (Davis et al. 1988), but their sensitivity to anthropogenic activities may be influenced by the overall level of human activity within their range. In locations that lack frequent human activity, sea otters appear to have a lower threshold for disturbance (Udevitz et al. 1995).

Exposure to high levels of sound is known to cause changes in behavior, masking of communications, temporary or permanent changes in hearing sensitivity, discomfort, and injury to sea otters. Individual sea otter reactions to high levels of sound would depend on numerous factors including its prior exposure to the activity, its need to be in the area, its physiological status, and the location, timing, frequency, intensity, and duration of the encounter. Construction activities that mask vocalizations or other important acoustic information for sea otters present in the action area would affect communication among individuals since sea otters, especially mothers and pups, use sound for communication in air (McShane et al. 1995) or affect their ability to receive information from their environment such as monitoring underwater sound to avoid predators (Davis et al. 1987, Erbe et al. 2019). Temporary disturbance of sea otters or localized displacement reactions are the most likely effects to occur from noise exposure.

Sound moves faster through water than it does in air; therefore, noise becomes less loud faster in air than if traveling in water. This means that the area of potential disturbance for in-air noise is less than that for in-water noise. Since impact pile driving would occur inland, no in-water noise would be generated in the marine environment and only in-air noise would be of concern for sea otters. While we do not currently know all the details needed to more accurately predict the maximum distance at which there is no longer a potential for in-air noise to disturb sea otters, we use information that is currently known for pile driving activities related to road construction and previously estimated in-air noise generated by pile driving for another project to make predictions.

Construction of the bridge is expected to involve impact pile driving of eight 24-inch (61-centimeter) steel closed end piles and eight 14-inch H-piles (HP 14 x 117 (ADOT&PF 2026*a*, *b*). Therefore, using in-air sound levels (measured in decibels, dB) determined previously (USFWS 2023*b*), we estimate the maximum distance at which there is no longer a potential for disturbance to sea otters was 72 ft (22 m) from pile driving. This is the distance at which in-air noise levels from pile driving would fall below the threshold (100 dB re 20 micropascal [µPa]) at which the Service considers sea otters behaviorally harassed when exposed to airborne sounds. Given that pile driving for the proposed bridge would occur approximately 1.3 mi (2 km) northeast of Kinzarof Lagoon and over 5 mi (8 km) from Izembek Lagoon, significant disruptions of breeding, feeding, or sheltering to sea otters from in-air noise generated by pile driving would be unlikely (Figure 30). However, previous estimates were based on numerous project specifics (number of days of activity, density of sea otters in the area, sound level, pile size, and sound source) so this estimate serves only as a proxy and could change if details of pile driving for road construction change.

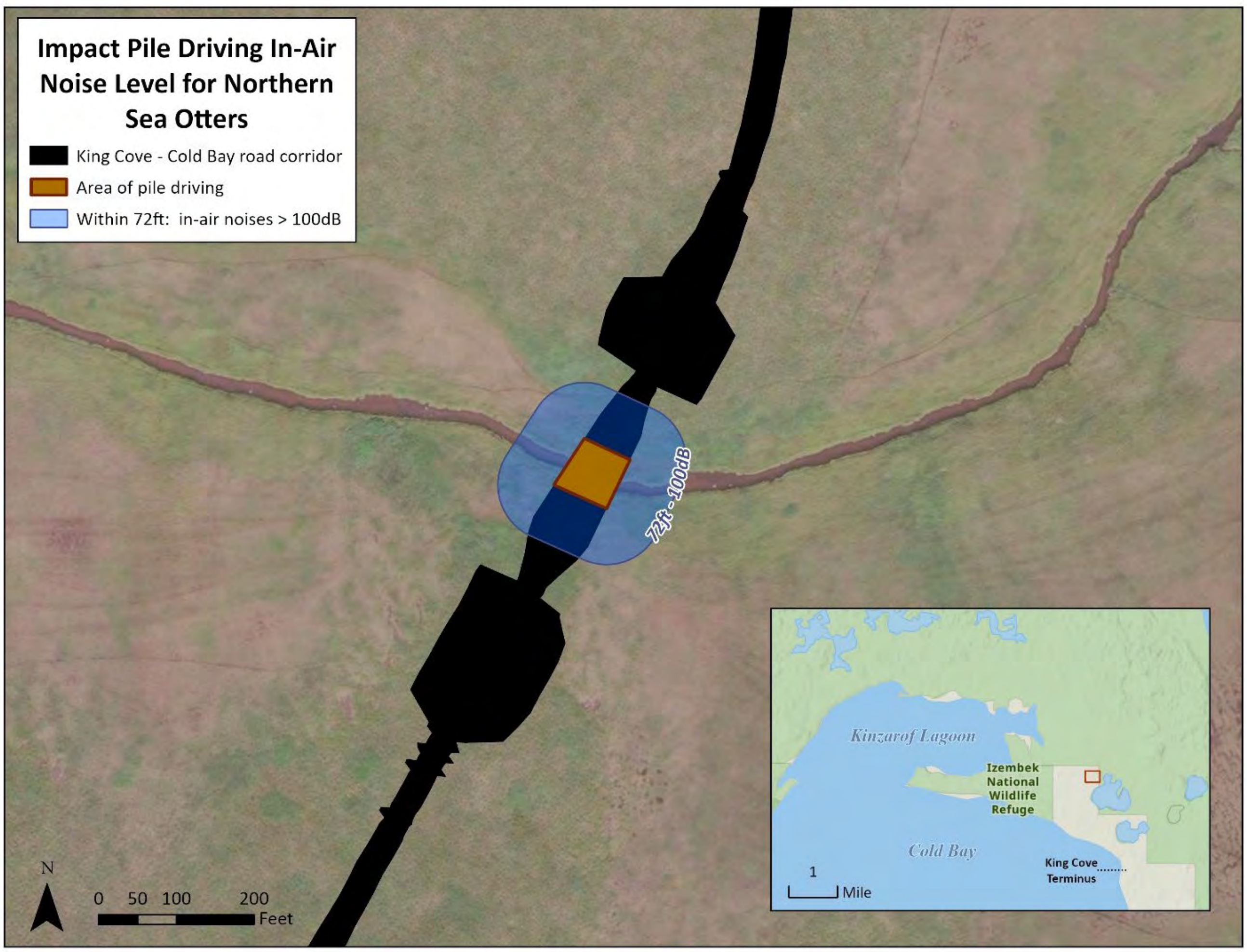

Figure 30. Predicted distance (72 ft) at which in-air noise levels (in decibels[dB]) from pile driving would fall below the threshold (100 dB re 20 µPa) at which the Service considers sea otters behaviorally harassed when exposed to airborne sounds.

We estimate most construction noise levels would fall to ambient levels approximately 1 mi (1.6 km) away from the source (Table 11; USACE 2003). Construction noise is expected to be detectable within parts of the near-shore environments of Izembek Lagoon, Kinzarof Lagoon, and Cold Bay (Figure 25). However, this analysis considers sound levels in dBAs, which are weighted for human hearing and may not be applicable to how sea otters experience sound. We lack information needed to predict the exact noise levels that would reach either lagoon or exactly how it would be perceived by sea otters. Sound attenuation can be affected by weather, topography, vegetation, etc. However, given that we expect noise levels from pile driving attenuates to below sea otter harassment thresholds at 72 ft (22 m), we do not expect the lower sound generation of construction and maintenance equipment and activities would reach levels causing significant disruptions in sea otter behavior within either lagoon.

Use of the road is also expected to increase noise levels in the action area. We expect most vehicle noise to fall to ambient levels before reaching Izembek Lagoon (Figure 27). Vehicle traffic would likely be detectable above background levels in small portions of the near-shore environment of Kinzarof Lagoon and Cold Bay (Figure 27). Given the low levels of projected daily traffic (average daily traffic is projected less than 50 vehicles per day), noise associated with road use would be of short duration and intermittent but would occur for the life of the road. Because these traffic-caused noise impacts are expected to be of low magnitude and duration, we do not expect measurable biological effects to northern sea otters.

5.4.1.2 Vessel-based Disturbance

Vessel traffic in Cold Bay would increase slightly due to dedicated barge transport of construction equipment and materials from April 1 through November 30 (see conservation measure 7) during the 3-year construction window. Barges, pulled by tugboats, would be used to deliver materials to the project site via the existing hovercraft ramps at the Northeast Terminal and Cross Wind Cove. Northern sea otters within Kinzarof Lagoon or Cold Bay would be disturbed by barging activities during construction if vessels approach within distances at which sea otters typically respond. Vessels adhering to the minimum distances laid out in the conservation measures are expected to avoid disturbing sea otters. We expect northern sea otters in Izembek Lagoon to be disturbed by an increase in small vessel activity for hunting, subsistence, and recreation once a road is constructed. Sea otters disturbed by vessels would likely exhibit startle responses and move away from the disturbance, but such behavioral responses to individual disturbance events are not expected to significantly disrupt normal behavioral patterns.

Constructing a road along the Izembek Isthmus would facilitate access for the community of King Cove to the boat launch and other access points along the existing Cold Bay road network. This access is unlikely to result in a measurable increase in vessel use of Kinzarof Lagoon and Cold Bay, as these systems are already accessible to both communities. It is reasonably certain road access would result in increased vessel traffic and vessel-based activities in Izembek Lagoon, overlapping nearshore habitats used by sea otters.

We estimate vessel activity currently occurs in Izembek Lagoon at a minimum rate of 0.18 to 0.45 events per hour (see section 4.2.4.3). This rate measures the activity of small vessels used during waterfowl hunting, in areas overlapping sea otter distribution in Izembek Lagoon. We assume the majority of boating activity is from boat-based hunting, and that any increase in hunting activity would lead to a proportional increase in boating activity in Izembek Lagoon. Therefore, we expect a 2.53- to 2.94-fold increase in boating activity, resulting in a minimum activity rate of 0.46 to 1.32 vessel events per hour (see section 5.2.1.3 for a discussion quantifying the anticipated increase in vessel activity in Izembek Lagoon). The amount of disturbance to sea otters resulting from increased vessel use of Izembek Lagoon, which would be afforded by the road between King Cove and Cold Bay, would depend on the specific activities occurring and their duration, frequency, and intensity; accessibility of otters and their habitats during these activities; and other factors that are difficult to predict and assess. Sea otters using Izembek Lagoon would experience an increase in vessel-based disturbance, and this disturbance effect would continue for the life of the road.

A minority portion (30 to 35 percent) of the estimated increase in vessel-based disturbance would be due to anticipated changes in King Cove activities (as estimated based on changes in hunting in Appendix A). This could occur in the form of a shift in current hunting effort to Izembek Lagoon or as an increase in overall hunting effort (i.e., the same amount of hunting occurs in current locations accessible by King Cove and additional hunting occurs in increasingly accessible locations like Izembek Lagoon). Vessel-based hunting activities that shift from previous locations to Izembek Lagoon would decrease disturbance to sea otters in those areas (such as Kinzarof Lagoon, Cold Bay, and King Cove Lagoon).

Boats operating in sea otter habitat risk disturbing sea otters. Sea otters are vulnerable to disturbance by vessel traffic, especially female otters with pups or when congregating in rafts. Reactions to vessel activity include increased alertness, increased vocalizations, vacating the area, or diving. Sea otter populations in Alaska have been observed avoiding areas with heavy vessel traffic and then returning to those areas during seasons of less traffic (Garshelis and Garshelis 1984). A sea otter's response to disturbance depends on numerous factors including, but not limited to, a sea otter's previous experience with vessels, intensity and duration of the disturbance, and distance from the disturbance. Large or repeated reactions lead to amplified impacts, including induced stress, separations of sea otter pups from their mother, and energy deficits (Barrett et al. 2025).

5.4.1.3 Hunting-based Disturbance and Other Human Disturbance

We expect northern sea otters would also be disturbed by other increased human activity in the area. For example, a road constructed along the isthmus would facilitate easier overland access (on foot or via ATV) to the shoreline of Izembek or Kinzarof Lagoons; we expect this increased access to increase shoreline-based hunting. Sea otters disturbed by gunshot or human presence would likely exhibit startle responses and move away from noise sources, but such behavioral responses to individual disturbance events are not expected to significantly disrupt normal behavioral patterns.

We do not have estimates on current rates of disturbance to sea otters in Izembek or Kinzarof Lagoons. However, we expect the increase in risk of disturbance to be proportionate to the increase in human activities, including sport hunting, subsistence hunting, vessel use, and ATV use, in the lagoons or along the shorelines. We predict a 2.53- to 2.94-fold increase in all hunting activities (combined subsistence use and sport hunting) at Izembek Lagoon relative to current levels (see Appendix A for detailed discussion of these calculations). Such increases would contribute to increased risk of disturbance to sea otters through noise, gunshot, visual disturbance, etc. While this is a substantial total, the majority of this increase would be focused on waterfowl and not on pursuing and harvesting sea otters. We expect most sea otters using Izembek Lagoon would experience these disturbance effects but anticipate they would be of shorter frequency, duration, and intensity compared to Steller's eiders and other waterfowl.

Additionally, we expect ATV activity to increase approximately seven times above current levels in the action area (assuming increases in ATV traffic are proportional to the expected increase in new off-road vehicle trails; see section 4.1.7 and 5.2.1.4). Such increases in ATV traffic also increase the risk of disturbance to sea otters. Disturbance from increased ATV use in the action area includes visual or noise disturbance and would also depend on proximity to nearshore habitats and conditions that affect noise levels, such as weather conditions.

These predicted increases in human activity in the action area indicate that sea otters would experience increases in disturbance from multiple sources. While not all sea otters would be disturbed by each event, it is expected that a high proportion of sea otters would experience disturbance at some point in time from increased activity. Given that waterfowl hunting occurs from shoreline-based locations and from boats on the water, and no part of Izembek Lagoon is inaccessible to hunting given current modes of access and hunting methods, sea otters in any part of the lagoon may experience disturbance. Sea otters that experience increased disturbance are expected to exhibit one of three primary responses. Sea otters may leave the area so they are no longer disturbed, stay in the area but acclimate to the increased levels of disturbance, or stay in the area and experience increased stress. It is expected that any sea otters that do not acclimate or move away would experience adverse effects. Mothers, who experience reduced body condition due to pup rearing demands (Thometz et al 2014), and other energy-stressed individuals would be most likely to experience the consequences of increased stress and energy costs due to disturbance. While we expect most sea otters to leave the area or acclimate to and tolerate the increased disturbance levels, sea otters that stay but do not acclimate could experience repeated disruption of normal behaviors causing increased stress and energy deficits, leading to decreased fitness, survival probability, and reproductive success, for those individuals. Overall, we expect few if any sea otters would suffer reduced fitness, survival probability, and/or reproductive success.

5.4.2 Vessel Strike and Collision Risk

Boats operating in sea otter habitat run the risk of striking them with the boat propeller or hull causing injury or death. The likelihood of vessel strikes is primarily related to vessel speed (Vanderlaan and Taggart 2007) and most documented vessel strikes of sea otters involve small, fast-moving vessels (USFWS 2020). Barges typically move at slow speeds (less than 10 knots), which reduces the likelihood of sea otter strike. Additionally, project specific vessels will adhere to the Service's guidance for vessel operators (see 1.5, conservation measures 1, 12, and 13) which will reduce likelihood of strike and disturbance to sea otters in Cold Bay, and therefore we do not expect project specific vessels to strike sea otters. However, we expect the increase in small vessel activity in Izembek Lagoon after road construction would increase the likelihood for vessel traffic disturbance and strike to sea otters for the lifetime of the road.

Increased vessel traffic is expected in Izembek Lagoon following construction of the road. Beyond construction, we anticipate the majority of the change in vessel traffic would be in the form of small skiffs, primary stemming from boat-based hunting activities in the fall. Other changes in boating (from fishing and other recreational activities) may occur, but we anticipate it will occur at levels lower than what is anticipated during the fall general hunting season. Further, we anticipate the change in vessel traffic to be primarily from small vessels because boat-based hunting typically occurs from small skiffs. An increase in small vessel activity in Izembek Lagoon would increase spatial overlap between vessels and large numbers of sea otters, which would increase the risk of vessel strikes. These small vessels operate at higher speeds, which also adds to risk. The amount of increased collision risk to sea otters resulting from increased vessel use of Izembek Lagoon would depend on the number of additional vessels using the area; the specific activities occurring and their duration, frequency, and intensity; accessibility of otters and their habitats during these activities; time of year; vessel speed; and other factors that are difficult to predict and assess. We assume the majority of boating activity is from boat-based hunting, and that any increase in hunting activity would lead to a proportional increase in boating activity in Izembek Lagoon. Therefore, we expect a 2.53- to 2.94-fold increase in boating activity and use this estimated increase as a proxy for increase in strike. Thus, we estimate a 2.53 to 2.94-fold increase in the risk of vessel strike to northern sea otters. We estimate up to three northern sea otters would be injured or killed via vessel strike per year in Izembek Lagoon after the road is constructed (1 sea otter per year multiplied by 2.53 or 2.95 and rounded up; see section 5.2.1.3 for discussion on the anticipated change in vessel activity in Izembek Lagoon). Although not all risk would lead to strike, this represents our best estimate based on available information. This estimate only accounts for the potential increase in vessel activity from hunters and does not include other activities. We do not calculate an expected increase for Kinzarof Lagoon since this area is already accessible to King Cove residents by boat.

5.4.3 Environmental Contaminants and Pollution

The use of heavy equipment during construction or maintenance, increased vessel traffic during and after road construction, and increased vehicular traffic along the road corridor (i.e., road vehicles, ATVs, and snowmachines) or along the previously remote coastline of Izembek Lagoon would increase the risk of accidental fuel and oil spills. Contaminants entering marine environments, including through stormwater runoff or snowmelt, would impair water quality and adversely affect sea otters and their habitat. Exposure to petroleum hydrocarbons affects a sea otter's ability to thermoregulate (Lipscomb et al. 1994), and polyaromatic hydrocarbons may be toxic to sea otters if ingested during preening or by consumption of contaminated prey (Johnson and Garshelis 1995). Contamination of sea otter fur eliminates the air layer between the fur and skin that keeps sea otters dry and warm, since they lack a layer of blubber (a thick fat layer under the skin), and it affects the top layer of fur that wicks away water. This allows water to penetrate the skin and reduces insulation. If sea otters are unable to maintain normal body temperature, they become hypothermic which has consequences that include death (Davis et al. 1988). Effects from spills and pollution to sea otter habitat and prey are discussed in section 5.6.2.

It is likely some amount of hazardous materials release would occur, through accidental fuel and oil spills. There is a low risk the project would result in a large spill of petroleum hydrocarbons or other contaminants, but there is a high probability that small spills will occur periodically. Some of the potential effects of hazardous materials release could be minimized by responsible parties during road construction and maintenance, but no pertinent mitigation measures have been incorporated into the proposed action. Some number of small spills to the roadway or off-road environment would persist; when the source of a spill is not known (often the case with accidental spills), there may not be a responsible party to contain and/or cleanup the spill. Effects of hazardous materials release will be minimized by responsible parties (including ADOT&PF and their contractors and Aleutians East Borough) during road construction and maintenance, in part, through the development and use of best management practices and policies in hazardous material and spill plans (see conservation measure 14). While sea otters are vulnerable to the effects of oil spills and other sources of contamination, we expect few sea otters would encounter spilled contaminants as an effect of the proposed action because: 1) most spills are preventable and 2) if accidental spills occurred, they would most likely be of low volume and localized. A contaminants spill in important and/or high-use areas would be expected to encounter some number of individuals and result in substantial impacts to sea otters present and/or if prey resources became contaminated. Large contaminants spills are not expected to occur consequent to the proposed action. Small spills, which are considered likely, would be expected to remain localized and affect, at most, only a few sea otters or a small area containing prey resources. Small spills would therefore not be expected to have a population-level effect.

Increased fishing and other human activity within Izembek Lagoon and along the isthmus would also increase the potential for trash to accumulate in the local environment and enter the marine environment, including from the roadway and vessels using the lagoons and bay due to the typically windy conditions in this region. Effects to sea otters may include ingestion and entanglement (e.g., fishing line). There is no evidence that trash is currently affecting sea otters in the action area. While we cannot characterize the level of trash that would enter the environment, we expect the level of trash entering the system from road use to be small because the road is a single lane at least 0.5 mi (0.8 km) from the lagoons at the closest points and is expected to receive a relatively low volume of traffic, given the small size of the two connected communities. In the aquatic environments of the Izembek Complex, both human use and sea otter presence are dispersed throughout the large area; any introduced trash would likely be encountered by only a small number of individual otters. Therefore, although the proposed action is likely to result in increased human activity, which in turn is expected to result in an increase in trash being introduced to the environment, we have no evidence to suggest that adverse effects to sea otters from trash are a reasonably certain to occur effect of the action; we conclude the likelihood of adverse effect is discountable and therefore it is not an indirect effect of the action.

5.4.4 Habitat Loss and Degradation

Construction of the road embankment would result in loss of approximately 161 ac (65.2 ha) of undisturbed fish and wildlife habitat along the Izembek Isthmus plus 22 ac (8.9 ha) of lands with some level of existing anthropogenic disturbance (e.g., related to trails; (ADOT&PF 2026*b*); the road would also cross multiple streams and wetlands, with plans for installation of 93 drainage structures. Disruption to surface and subsurface flows are expected. Water for construction and future maintenance would be derived from local sources and would have additional effects. See section 5.2.4 for a full discussion on the effects to habitat from constructing a road in a largely undisturbed landscape.

A review of 58 publications that assessed the spatial influence of road impacts (including changes in animal abundance, density and population size; modification in animal behavior; reductions of species richness and diversity, changes of landscape patterns, facilitation of resource extraction and hunting; noise increase) found that these impacts were observed 100 percent of the time within 0.6 mi (1 km) of the road and were observed 39 percent of the time within 1.2 mi (2 km) of the road (Ibisch et al. 2016). Portions of the proposed road would fall within this distance of marine and lagoon habitats used by northern sea otters, with the road ranging from 0.5 to 1 mile (0.8 to 1.6 km) from Kinzarof Lagoon and 0.7 mi (1.1 km) from Izembek Lagoon at the closest point. However, the spatial extent of road impacts varies by road type, traffic volume, surrounding habitat, landscape, terrain features, seasons, weather conditions, and time (Ibisch et al. 2016). While impacts are consistently observed within 0.6 mi (1 km), they are not limited to this distance. The downstream effects of the proposed road to wetland habitats along the isthmus may extend beyond this distance, given local hydrology and the interconnectedness of habitats (including the lagoon systems) in the action area.

In summary, road construction and use would result in permanent ecological change, resulting from direct and indirect effects to habitats along the isthmus, which would have cascading effects to adjacent marine areas. Previous conclusions by the Service support that a high level of permanent ecological degradation to habitat would occur from the construction of a road through Izembek Refuge (DOI/USFWS 2013*b*). The lagoons on either side of the isthmus are hydrologically connected through surface and subsurface flow (see sections 1.3 and 4.1.1), and changes to water quantity and quality flowing into these lagoons would lead to impacts to habitats and resources used by northern sea otters. We expect these impacts would cause adverse impacts to prey resources and therefore adverse effects to sea otters and would be additive to other ongoing threats and changes (such as reductions in prey species biomass).

5.4.4.1 Turbidity and Sedimentation

Road construction and maintenance, materials excavation, and increased off road vehicle trail use contribute to road runoff and increase sediment loading and turbidity in the surrounding freshwater and marine environments. Road construction can also constrain distributary channels that would otherwise migrate through time, which can lead to channel incisions, diminished habitats, and changes in the plant communities (van Proosdij et al. 2009, Limpinsel et al. 2023). Off-road traffic, such as ATVs, would establish routes away from the roadway into adjacent areas of Izembek Refuge, resulting in pioneering trails and damage to habitats along the isthmus. These routes would cause soil compaction and erosion and increase sedimentation into nearby waterbodies. Sedimentation and related effects would be highest during construction and would continue during road maintenance and use. There are multiple ways for sediment to mobilize into waterbodies, including through channel erosion and by dust generated from development activities or use of the roadway. Sediment inputs from development activities can impact water quality and reduce the abundance, taxonomic richness, and diversity of aquatic communities. See section 5.2.4.1 for discussion on the effects of sediment inputs from development activities on nearshore habitats, wetlands, eelgrass, and macroinvertebrates.

Wetlands slow runoff, moderate stream flows, and provide important habitats, such as nesting and escape cover. For example, eelgrass beds and kelp not only provide an abundant macroinvertebrate community, but also provide sheltered (i.e., low wave energy) and shallow locations where northern sea otters congregate to rest and avoid large marine predators such as orcas. These wetland functions are reduced by roads and the associated use of ATVs. Riparian areas and wetlands connected with streams that are paralleled or crossed by ATVs experience a loss of vegetation, bank erosion, a reduction in water quality, and transport of sediment to coastal wetlands and eelgrass beds. Shrub vegetation, coupled with a harsh climate and slow rates of recovery for soils and vegetation, predispose the action area to erosion (DOI/USFWS 2013*a*); this, combined with impacts from the road and ATV use would result in immediate and severe degradation of wetland habitats.

Seaweeds, such as kelp, provide nursery habitat, feeding grounds, and shelter for aquatic organisms, like macroinvertebrates, and help to stabilize the water column from changes in nutrient concentrations and suspended sediments (Dayton et al. 1984, Duarte 1995, Watanabe et al. 2016). Kelp forests are also important habitat to sea otters, offering foraging, resting, and nursery habitat. Increased sedimentation impacts kelp by reducing substrate availability and light required for photosynthesis, inhibiting spore attachment and early-stage growth, and can lead to increased scour and subsequent mortality (Coelho et al. 2000, Watanabe et al. 2016, Picard et al. 2022). Sediment-tolerant turf algae can outcompete kelp where sediment deposition occurs, further changing the composition of nearshore aquatic communities (Connell et al. 2008, Moy and Christie 2012, Filbee-Dexter and Wernberg 2018, Picard et al. 2022). Changes in kelp communities due to sedimentation would reduce macroinvertebrate prey availability and suitable habitat for otters in the area. Sea otters may expend more energy in search of prey or suitable habitat. In cases where large tracts of kelp are impacted, sea otters may shift in distribution.

We expect physical and behavioral effects to macroinvertebrate prey from increased sedimentation and reduced water quality would result in shifts in distribution of sea otter prey and lead to sea otters expending more energy while foraging, including if they are forced to forage more hours or travel farther in search of prey. Prey distribution shifts are expected to be temporary in response to most construction activities, but the road itself would be a permanent feature on the landscape, and effects related to changes in local hydrology (e.g., through water impoundment or channel incision) or runoff are expected to exist for the life of the road. Similarly, effects related to road maintenance and use (e.g., fugitive dust, runoff of small spills of hazardous materials) would be long-term. The amount and scale of effects to prey species would depend on the magnitude of sedimentation and thus are difficult to predict.

Sedimentation from road use and increased human use of the area would be harder to minimize but is also difficult to quantify. However, we calculated a reasonable increase in trails/ATV transgressions we might expect onto the isthmus with additional miles of road constructed and assume that the rate of increase of trails would approximate the increase in magnitude of erosion and sedimentation into surrounding waterbodies from ATV use. We estimate approximately 95.5 mi (153.7 km) of new off-road vehicular trails will impact the Izembek Isthmus with construction of 13.3 mi (21.4 km) of road in areas (see 5.2.1.4. for full discussion of this calculation).

In summary, we expect some level of increased sedimentation to occur. We estimate a sevenfold increase in sedimentation from increased ATV use alone. Such increases in sedimentation would impair eelgrass and kelp growth in nearshore areas receiving affected inputs and these impairments would also affect prey species northern sea otters depend on. Similarly, we expect turbidity to increase in the action area, as well as the potential for spills of hazardous materials during road construction, maintenance, and use, resulting in detrimental impacts to northern sea otter habitat and prey species. It is also important to note that sedimentation, turbidity, and contamination impacts resulting from the proposed road would contribute to existing stressors on eelgrass and kelp habitat and macroinvertebrate prey within the Izembek Complex (see 3.1.4.3 and 3.1.4.10). We anticipate the proposed conservation measures (i.e., the SWPPP and Culvert Design Guidelines for Ecological Function) will reduce some sedimentation (only during road construction) and spills of hazardous materials; however, given the impacts that have already been documented from increased off-road vehicle use associated with the 17.2-mi (27.7-km) King Cove extension road (e.g., Figure 29; see section 5.2.4.1) and the anticipated ongoing use of the proposed road, adverse impacts to nearby eelgrass and kelp habitat and associated macroinvertebrate prey are expected into the foreseeable future. Such impacts are expected to reduce the function and availability of some nearshore habitat to sea otters.

5.4.5 Harvest and Other Sources of Mortality

Harvest of sea otters in the action area is reasonably certain to increase as a result of road construction. King Cove residents do not currently have an easy way to access Izembek Lagoon for vessel-based activities, and we expect a road along the isthmus would also facilitate access from King Cove to boat launches along the existing Cold Bay road network, leading to an increase in vessel-based subsistence hunting in Izembek Lagoon. Therefore, as a consequence of the proposed action, we assume increased harvest of northern sea otters in Izembek Lagoon would occur and would be proportional to the change in number of subsistence hunters that would have access to Izembek Lagoon following road construction. In 2016, 1.1 percent of King Cove households attempted to harvest sea otters (but were unsuccessful) and in 1992, 2.7 percent households attempted and successfully harvested 8 sea otters (ADF&G 2025). Based on the numbers harvested from King Cove residents in 1992 (ADF&G 2025) and the number harvested in the Izembek Complexby King Cove and Cold Bay residents between 2014 and 2025 (MTRP data), we would expect up to approximately 14 sea otters harvested from the Izembek Complex in a year. We do not expect 14 individuals would be harvested every year since there are years with no reported harvest and the average number of sea otters harvested between 2014 and 2025 was 5 otters (rounded up from 4.6). FurthermoreFurthermore, it is hard to predict whether subsistence hunters from King Cove would hunt exclusively in Izembek Lagoon, continue to harvest around King Cove, Cold Bay, and Kinzarof Lagoon, or harvest in multiple areas. The road would also allow increased access by Alaska Native hunters to the sea otters using Kinzarof Lagoon, either by foot or via ATVs (DOI/USFWS 2013*a*), potentially increasing the number of sea otters that are harvested; however, Kinzarof Lagoon is already relatively easily accessible by boat. Therefore, we expect up to five sea otters may be harvested from Izembek Lagoon each year.

While northern sea otters do not typically move across land, they have been observed moving across the Izembek isthmus, particularly in years with severe and persistent ice cover in Izembek Lagoon (USFWS 2004*a*). Such behavior would likely be limited to years when foraging opportunities are severely limited in Izembek Lagoon in the winter due to ice covering most or all of the lagoon. In these cases, sea otters in search of open water to forage may move inland or attempt crossing the isthmus to Kinzarof Lagoon. The road, traffic, and associated activities would create a barrier to movement between the lagoons. The extent of impacts from the road and traffic as a behavioral barrier to sea otters and collision risk factor is not known but would occur through chronic disturbance, energetic costs, stress, and possible avoidance. However, we expect the impacts and risk to sea otters would be limited to discrete, infrequent events.

We considered the potential for the action to increase effects to sea otters through other sources of mortality. In order to treat these sources as indirect effects in the biological opinion, they must be reasonably certain to occur, as evidenced by appropriations, work plans, permits issued, or budgeting; they follow a pattern of activity undertaken by the agency in the action area; or they are a logical extension of the proposed action. We dismissed the following as not reasonably certain to occur as a consequence of the proposed action: increased rate of incidental fisheries bycatch, effects from re-opening of the fish processing plant, and effects from an increase in other recreational activities. See section 5.2.6 for a full discussion on why these are not reasonably certain to occur.

5.4.6 Effects on Recovery

The recovery objectives and criteria for northern sea otters are discussed in Section 3.3.7; there are three main objectives identified in the sea otter recovery plan (USFWS 2013). The plan also breaks down recovery criteria by MU and states that each MU will be evaluated for delisting criteria independently. Delisting should be considered when three of the five MUs meet all the recovery criteria (but not if any MU meets the criteria for uplisting described in the recovery plan). According to the most recent 5-year review (USFWS 2021*b*), the recovery criteria have not been met.

The first recovery objective for sea otters is to "achieve and maintain a self-sustaining population of sea otters in each MU." Given its relatively low population size, the South Alaska Peninsula MU has low resiliency and may not meet this criterion long-term. However, we do not expect effects of the action to detract from this goal since we do not expect any sea otters to be removed from the South Alaska Peninsula MU as a consequence of the action. The Bristol Bay MU has a moderate population size and thus has more resiliency to withstand stochastic events or cumulative impacts over time. We expect an increase in human activity after the road is constructed would increase the risk of vessel strike to sea otters within Izembek Lagoon, which would result in up to three sea otters a year removed from the Bristol Bay MU due to vessel strike over the life of the road (up to 150 sea otters over 50 years). We also expect an increase in sea otter harvest in Izembek Lagoon (up to 5 sea otters harvested a year or up to 250 sea otters over 50 years). These maximum estimates (400 total sea otters over 50 years) would represent approximately 4 percent of the current MU population (9,733 sea otters). These effects would be unlikely to cause a noticeable reduction in listed sea otter abundance within the MU given the current MU size or across their range, given the current total population size (51,935 sea otters).

Thus, we do not expect that this effect would preclude attainment of the first recovery objective. We do not currently have evidence to suggest that this effect combined with the baseline and cumulative effects would make this objective unachievable.

The second recovery objective is to "maintain enough sea otters to ensure that they are playing a functional role in their nearshore ecosystem." Since we expect relatively few sea otters to be removed from the population over 50 years, effects of the proposed action would not preclude attainment of this objective.

The third recovery objective for sea otters is to "mitigate threats sufficiently to ensure persistence of sea otters." Effects of the action would not affect the persistence of either MU, with only a few sea otters a year expected to be permanently removed from the Bristol Bay MU. Therefore, although the action considered herein would not contribute positively to mitigating threats, the proposed action would not prevent achievement of this recovery objective.

In summary, we would not anticipate measurable population impacts from the loss of up to three sea otters a year from collisions with vessels after the road is constructed and increases in harvest over the life of the road. Our evaluation indicates the proposed action is not expected to reduce the ability to achieve any of the three recovery objectives.

5.5 Designated Critical Habitat for Northern Sea Otters

Activities associated with the establishment of a road would occur adjacent to two important high density sea otter concentration areas that are designated critical habitat (Unit 3: South Alaska Peninsula) in Kinzarof Lagoon and northern Cold Bay and in Izembek Lagoon (Unit 4: Bristol Bay).

5.5.1 Turbidity and Sedimentation

Road construction and maintenance, materials excavation, and increased off road vehicle trail use contribute to road runoff and increase sediment loading and turbidity in the surrounding freshwater and marine environments. Road construction can also constrain distributary channels that would otherwise migrate through time, which can lead to channel incisions, diminished habitats, and changes in the plant communities (van Proosdij et al. 2009, Limpinsel et al. 2023). Off-road traffic, such as ATVs, would establish routes away from the roadway into adjacent areas of Izembek Refuge, resulting in pioneering trails and damage to habitats along the isthmus. These routes would cause soil compaction and erosion and increase sedimentation into nearby waterbodies. Sedimentation and related effects would be highest during construction and would continue during road maintenance and use. There are multiple ways for sediment to mobilize into waterbodies, including through channel erosion and by dust generated from development activities or use of the roadway. Sediment inputs from development activities can impact water quality and reduce the abundance, taxonomic richness, and diversity of aquatic communities. See sections 5.2.4.1 and 5.4.4.1 for discussion on the effects of sediment inputs from development activities on nearshore habitats, wetlands, eelgrass, and macroinvertebrates.

Turbidity and sedimentation are expected to be mostly temporary and localized during construction activities (especially with the implementation of best management practices such as a SWPPP), but they would cause displacement of benthic macroinvertebrate prey species and/or result in changes to the condition (e.g., size, quality, abundance) of prey and impact kelp communities in the immediate area by decreasing sunlight or through physical influence of particulate matter (Longstaff and Dennison 1999, Gorgula and Connell 2004, Watanabe et al. 2016, Picard et al. 2022). If reductions in prey condition are large enough, this would lead to reduced nutritional or energetic value to northern sea otters.

Road use and maintenance and activities associated with increased access, such as off-road use of ATVs, would also contribute to sedimentation and turbidity after construction and presumably for the life of the road. We estimate a sevenfold increase in sedimentation from increased ATV use alone. Such increases in sedimentation are likely to reduce the quantity and/or quality of marine invertebrates, marine benthic communities, and kelp and eelgrass habitat where degraded instream inputs occur. The downstream effects of turbidity and sedimentation related to road use and associated activities are expected to impact a small portion of sea otter designated critical habitat. However, these areas of critical habitat in Izembek and Kinzarof Lagoons and upper Cold Bay are especially important due to high productivity and high density of PCEs. Impacts resulting from the proposed road would contribute to existing stressors on eelgrass and kelp habitat and macroinvertebrate prey within the Izembek Complex (see 4.4.3.3 and 4.5). We anticipate that the proposed conservation measures (e.g., the SWPPP and Culvert Design Guidelines for Ecological Function) will reduce the potential for sedimentation (only during road construction) and spills of hazardous materials; however, given the impacts that have already been documented from increased off-road vehicle use associated with the 17.2-mi (27.7-km) King Cove extension road (see section 5.2.4.1) and the anticipated ongoing use of the proposed road, we expect a reduction in the quantity and/or quality of marine invertebrates, marine benthic communities, and eelgrass or kelp habitats where degraded instream inputs enter the lagoon. We expect this effect would persist for the foreseeable future.

5.5.2 Accidental Spills and Other Environmental Contaminants

The use of heavy equipment during construction and the subsequent increased vessel and vehicle traffic (i.e., ATVs, snowmachines, cars) would increase the risk of accidental fuel and oil spills, with direct and indirect effects to northern sea otter critical habitat. Contaminants and petroleum hydrocarbons that enter the marine environment would impact prey resources, kelp, eelgrass, and other physical habitat features they contact. Oil can be toxic to invertebrates or impact them through smothering or by altering feeding rates or shell formation (USFWS 2004*b*). Invertebrates may accumulate high levels of contaminants that can be passed on to predators, such as sea otters. Marine algae and seaweed respond variably to oil, but spills may lead to die-offs for some species. Oil can prevent the germination and growth of marine plants, including kelp, but most vegetation appears to recover after cleanup (USFWS 2004*b*). Oil can remain in the environment long after a spill event, in the subsurface sediments under gravel shorelines and in soft substrates, affecting nearshore habitats longer than pelagic or offshore habitats.

There is a low risk the project would result in a large spill of petroleum hydrocarbons or other contaminants. The risk of small spills should be low during road construction; implementation of a SWPPP will reduce the risk of contaminants entering the environment through stormwater runoff. The risk of small spills would be minimized by responsible parties (including ADOT&PF and their contractors and Aleutians East Borough) during road construction and maintenance, in part, through the development and use of best management practice and policies in hazardous material and spill plans (see conservation measure 14).

There is a high probability of small spills during road use and related off-road and on-water activities. Eelgrass and kelp that are exposed to spills would experience die-offs in localized habitat patches at a small scale. Oil spills would affect any macroinvertebrates (prey species for sea otters) directly encountered, through toxicity or physical effects, or indirectly through effects to the habitats and substrates on which macroinvertebrates rely. Oil can remain in the environment long after a spill event, in the subsurface sediments under gravel shorelines and in soft substrates, affecting nearshore habitats longer than pelagic or offshore habitats. Most vegetation affected by oil spills would recover after some amount of time, and most macroinvertebrate communities would subsequently also recover (although we would expect the permanent loss of some individuals). It is difficult to characterize small, accidental spills and the rates at which they would occur or to measure the likely magnitude of effect, given this effect would be patchy and would therefore depend on several unknown variables. However, the risk of small spills would persist for the duration of road maintenance and use into the foreseeable future and therefore we expect at least small, localized effects to eelgrass and kelp, including reduced growth and die-offs caused by small, discrete spill events. We expect most of these effects to be in the nearshore marine environments where freshwater inputs occur although spills from vessels could occur farther from shore, depending on their location when a spill occurs. The risk of small spills would persist for the foreseeable future.

5.5.3 Habitat Loss and Degradation

No direct loss of northern sea otter critical habitat is expected through placement of fill for construction of the road embankment. However, construction of the road embankment and its associated activities (e.g., pile driving for a stream crossing, material site development, use of local water sources for compaction) would alter the habitat through disruption to surface and subsurface flows (see section 5.2.4 for discussion on how roads alter landscapes). Ongoing maintenance and use of the road, and activities made possible by presence of the road (e.g., increased off-road ATV use) would result in permanent ecological change along the Izembek Isthmus, causing indirect effects to the connected lagoon system and changes to eelgrass beds, kelp, and benthic prey species. We expect a reduction in the quantity and/or quality of marine invertebrates, marine benthic communities, and eelgrass or kelp habitats as a consequence of habitat loss and degradation and that such effects would persist into the foreseeable future.

Changes are already occurring in Izembek Lagoon and have resulted in impacts to PCEs: an apparent reduction in the total biomass and size of certain macroinvertebrates which northern sea otters prey on (based on prey samples in 2019 compared to 1998; Maliguine et al. 2025). Construction, road use and maintenance, ATV-related impacts, and other activities that cause increased sediment loading or introduce contaminants to the lagoon and impact eelgrass, kelp, and macroinvertebrate would be additive to existing stressors that are not currently well understood.

5.6 Summary of Effects of the Action

We expect consequences to Alaska-breeding Steller's eiders, the southwest distinct population segment of northern sea otters, and their designated critical habitats from activities including construction, maintenance, and use (including activities conducted by private parties) of a new road along the Izembek Isthmus to connect the communities of King Cove and Cold Bay (see Section 1.4).

5.6.1 Summary of Effects of the Action on the Alaska-Breeding Steller's Eider

For Alaska-breeding Steller's eiders, the effects of the action are:

- Disturbance caused by road construction activities
    - We expect all individuals using the nearshore aquatic environments of the Izembek Complex would be exposed to noise-related disturbance caused by construction activities. We expect these effects to be in the form of infrequent and temporary disruption of normal behaviors.
- Disturbance caused by an increase in hunting activities
    - We expect all individuals using the Izembek Complex would be exposed to hunting related disturbance events. We estimate that disturbed eiders would spend 2.85 to 8.26 percent of their daytime hourly budget responding to hunting disturbance in the fall when disturbance is expected to be the highest. This is a 2.53- to 2.94-fold increase in time above current levels.
- Disturbance caused by increased vessel activity
    - We expect all individuals using the Izembek Complex wouldould be exposed toto vessel-caused disturbance events. We estimate disturbed eiders would spend 2.35 to 6.81 percent of their daytime hourly budget responding to boating disturbance in the fall when disturbance is expected to be the highest. This is a 2.53- to 2.94-fold increase in time above current levels.
- We estimate Steller's eiders that are exposed to both hunting and boating disturbance in Izembek Lagoon would spend a total of 5.19 to 15.08 percent of their daytime daily budget responding to hunting and boating disturbance.
- Disturbance caused by an increase in off-road vehicle use
    - We expect all individuals using the nearshore aquatic environments of the Izembek Complex wouldwould be exposed to disturbance caused by off-road vehicle use.
- Injury or death caused by an increase in hunting activities resulting in inadvertent harvest
    - We expect one Alaska-breeding Steller's eider to be killed every 10 to 11 years as a result of subsistence and sport hunting activities. This is approximately 5 eiders over the 50-year life of the road.
- Injury or death caused by strike
    - We expect one Alaska-breeding Steller's eider to be killed every 8.33 to 164 years as a result of vessel strike. This is an approximate maximum of 6 eiders over the 50-year life of the road.
    - We expect one Alaska-breeding Steller's eider to be killed due to collisions with vertical structures during the 3-year construction window.

- Contaminants
    - We expect most spills would be small, remain localized, and affect, at most, only a few Alaska-breeding Steller's eiders or a small area containing prey resources. We expect individuals exposed to contaminants to suffer reduced fitness that would result in decreased survival probability.
- Habitat loss and degradation
    - We expect construction of the road would result in permanent ecological change along the Izembek Isthmus, including changes in water quantity and quality into Izembek Lagoon. We expect this to reduce the quantity and/or quality of nearshore marine invertebrates, marine benthic communities, and eelgrass habitats through habitat loss and degradation. These reductions would cause adverse effects such as reduced body condition or increased energy expenditure on feeding in some Steller's eiders.

5.6.2 Summary of Effects of the Action on Designated Critical Habitat for the Alaska-Breeding Steller's Eider

For critical habitat designated for Alaska-breeding Steller's eiders, the effects of the action are:

- Turbidity and sedimentation
    - We expect a reduction in the quantity and/or quality of marine invertebrates, marine benthic communities, and eelgrass habitats where degraded instream inputs enter Izembek Lagoon. We expect this effect would be limited to a small proportion of designated critical habitat within Izembek Lagoon and would persist for the foreseeable future.
- Accidental spills and other environmental contaminants
    - We expect reduced growth and die-offs of eelgrass and macroinvertebrate species caused by small, discrete spill events. We expect this effect would be limited to a small proportion of designated critical habitat within Izembek Lagoon and would persist for the foreseeable future.
- Habitat loss and degradation
    - We expect construction of the road would result in permanent ecological change along the Izembek Isthmus, including changes in water quantity and quality into Izembek Lagoon. We expect this to reduce the quantity and/or quality of nearshore marine invertebrates, marine benthic communities, and eelgrass habitats through habitat loss and degradation. We expect this effect would be limited to a small proportion of designated critical habitat within Izembek Lagoon and would persist for the foreseeable future.

5.6.3 Summary of Effects of the Action on Southwest Alaska DPS of Northern Sea Otter

For the Southwest Alaska DPS of northern sea otters, the effects of the action are:

- Disturbance from increased vessel activity, hunting, and off-road vehicle use
    - While not all sea otters would be disturbed by each event, we expect that a high proportion of sea otters in the Izembek Complex would be exposed to disturbance at some point in time from increased activity.

    - We expect a disruption of normal behaviors that would lead to increased stress and energy deficits and therefore reduced fitness for a small number of individuals, such as mothers with pups.
- Injury or death caused by vessel strike
    - We expect up to three northern sea otters would be injured or killed via vessel strike per year in Izembek Lagoon due to increased vessel activity after the construction of the road.
- Injury or death caused by exposure to contaminants
    - We conclude most spills would be small, remain localized, and affect, at most, only a few otters or a small area containing kelp or prey resources. We expect individuals exposed to contaminants to suffer reduced fitness that would result in decreased survival probability.
- Injury or death caused by harvest
    - We expect up to approximately an additional five sea otters above current baseline would be harvested for subsistence use from Izembek Lagoon in a year.
- Habitat loss and degradation
    - We expect construction of the road would result in permanent ecological change along the Izembek Isthmus, including changes in water quantity and quality into Izembek Lagoon and Kinzarof Lagoon. We expect this to reduce the quantity and/or quality of nearshore marine invertebrates, marine benthic communities, and kelp habitats through habitat loss and degradation. These reductions would cause adverse effects such as reduced body condition or increased energy expenditure on feeding in some northern sea otters.

5.6.4 Summary of Effects of the Action on Designated Critical Habitat for the Southwest Alaska DPS of Northern Sea Otter

For critical habitat designated for southwest Alaska DPS of northern sea otter, the effects of the action are:

- Turbidity and sedimentation
    - We expect a reduction in the quantity and/or quality of marine invertebrates, marine benthic communities, and kelp habitats where degraded instream inputs enter Izembek or Kinzarof lagoons. We expect this effect would be limited to a small proportion of designated critical habitat within Izembek Lagoon and Kinzarof Lagoon and would persist for the foreseeable future.
- Accidental spills and other environmental contaminants
    - We expect reduced growth and die-offs of kelp and macroinvertebrate species caused by small, discrete spill events. We expect this effect would be limited to a small proportion of designated critical habitat within Izembek Lagoon and Kinzarof Lagoon and would persist for the foreseeable future.
- Habitat loss and degradation
    - We expect construction of the road would result in permanent ecological change along the Izembek Isthmus, including changes in water quantity and quality into the lagoons. We expect this to reduce the quantity and/or quality of nearshore marine invertebrates, marine benthic communities, and kelp habitats as a consequence of habitat loss and degradation. We expect this effect would be limited to a small

proportion of designated critical habitat within Izembek Lagoon and Kinzarof Lagoon and would persist for the foreseeable future.

6 CUMULATIVE EFFECTS

Under the ESA, cumulative effects are those “effects of future State or private activities, not involving Federal activities, that are reasonably certain to occur within the action area” considered in this biological opinion. Future Federal actions that are unrelated to the Project are not considered in this section because they require separate consultation pursuant to section 7 of the ESA.

It is expected the future State, Tribal, local, or private actions that are reasonably certain to occur within the action area will be similar to those described in the Environmental Baseline (Section 4 of this biological opinion). Those actions include but are not limited to marine vessel activity, fisheries, pollution, noise, and coastal zone development.

The MMPA permits Alaska Natives to harvest sea otters for subsistence purposes, or for the purposes of creating authentic Native handicrafts and clothing, provided this is accomplished in a non-wasteful manner. The best available scientific information indicates the subsistence harvest by Alaska Natives has not had a major impact on the southwest Alaska DPS of the northern sea otter (USFWS 2013). Continued and increased subsistence harvest (see section 5.4.5) of sea otters in the action area is reasonably certain to occur, pursuant to the MMPA, in the foreseeable future; sea otters harvested by subsistence users would be removed from the population and therefore unavailable for future breeding and reproduction. Meanwhile, households eligible to participate in subsistence fishing activities have increased but there has been a temporal decrease in the number of subsistence fishing permits. (see section 4.1.6).

Below mean high water, the State of Alaska manages Izembek Lagoon and other areas of overlap between the Izembek State Game Refuge and the Federally managed Izembek Refuge. Certain activities within the lagoon would not require Federal authorization. One of these is use of certain motorized vessels (e.g., skiffs, fishing vessels, and inflatable boats), allowable in Izembek Lagoon under a State general permit (Special Area Permit SA25-II-0079-GP). Use of vehicles, including ATVs, below mean high water is allowable by the State under individual Special Area Permits through the ADF&G. The use of motorized vessels can directly affect ESA-listed species through visual or noise disturbance. Indirect affects to species would occur through damage to seagrass, kelp, or other aquatic vegetation by vessel propellers.

The State of Alaska Division of Oil and Gas has identified oil and gas prospecting and development as an appropriate use of this area; although protections are granted to Izembek State Game Refuge, surface entry in Izembek State Game Refuge for seismic surveys is allowable on a case-by-case basis. Surface entry on non-Federal lands may not require a Federal action but would still have impacts to listed species and their critical habitat in this area. We have considered the potential for these activities; however, there are no historic or ongoing activities of this type, and no known plans to conduct such activities in the future. Therefore, we conclude that oil and gas prospecting and development is not reasonably certain to occur within the action area.

In summary, we anticipate the scope and scale of industry development, marine traffic, and subsistence and recreational pursuits in the action area will at minimum continue at current levels and may experience small increases in the future. We expect the overall cumulative effects of future State or private activities to be consistent with the current state described in the Environmental Baseline.

7 CONCLUSION

Section 7(a)(2) of the ESA requires that federal agencies ensure that any action they authorize, fund, or carry out is not likely to jeopardize the continued existence of any endangered or threatened species or result in the destruction or adverse modification of designated critical habitat. The conclusion section presents the Service's opinion regarding whether the effects of the action and cumulative effects, when added to the environmental baseline and considered in light of the status of the species or critical habitat, are likely to jeopardize the continued existence of the species or result in destruction or adverse modification of critical habitat.

"Jeopardize the continued existence of" means to engage in an action that reasonably would be expected, directly or indirectly, to reduce appreciably the likelihood of both the survival and recovery of a listed species in the wild by reducing the reproduction, numbers, or distribution of that species. The following analysis relies on four components: (1) Status of the Species, (2) Environmental Baseline, (3) Effects of the Action, and (4) Cumulative Effects.

The destruction/adverse modification analysis relies on the same four components as the jeopardy analysis: (1) Status of Critical Habitat, (2) Environmental Baseline, (3) Effects of the Action, and (4) Cumulative Effects. For purposes of making the destruction or adverse modification determination, the effects of the proposed federal action, together with any cumulative effects, are evaluated to determine if the critical habitat would remain functional (or retain the current ability for the PCEs to be functionally re-established in areas of currently unsuitable but capable habitat) to serve its intended conservation/recovery role for the species.

The conclusions of this biological opinion are based on full implementation of the project as described in the Description of the Proposed Action section of this document, including any conservation measures that were incorporated into the project design.

7.1 Steller's Eider

The proposed action would construct a road through an ecologically important and sensitive wetland isthmus that is currently undeveloped. Listed Steller's eiders are present in the action area in high numbers to molt, overwinter, and stage in the lagoons adjacent to the isthmus. They are present because these lagoons support some of the largest eelgrass beds in the world, where Steller's eider prey species are abundant. The construction of a road across this isthmus would permanently change the landscape of the area and adversely affect the ESA-listed Steller's eider over the lifespan of the road. Adverse effects are expected through increased disturbance, increased collision risk with vessels, inadvertent harvest during legal hunting activities, and degradation of the habitat upon which the eiders rely for feeding and resting. Additional effects, including increased noise disturbance and collision risk with vertical structures, are likely during the 3-year construction window.

An estimated 12 to 15 percent of the listed entity is present in the Izembek Complex during the fall molt and by February up to 52 percent of the listed entity is present for overwintering. Between 50 to 93 percent of the listed entity may use the Izembek Complex during spring migration staging. A small number of non-breeding individuals may remain in the Izembek Complex during the summer. Due to the high number of eiders present in the action area, any activities overlapping times of year when eiders are present have the potential to affect a substantial portion of the listed entity.

<u>Numbers</u>

We expect effects of the action to decrease listed eider numbers through direct sources of mortality and indirectly through disturbance. We estimate a total of 12 Alaska-breeding eiders could be killed due to increased inadvertent harvest and collisions with vessels and vertical structures over the 53-year project (3-year construction window, 50-year life of the road; see 5.2.7 Effects on Recovery). Therefore, direct sources of mortality would result in the loss of 0.23 birds per year from the listed population, which is currently estimated at 406 birds; this would represent a loss of only a fraction of 1 percent (i.e., less than 1 percent) of the population per year. While any loss of eiders from the listed entity is concerning due to the small population size, we do not expect the loss of 0.23 birds per year to cause population level effects to the ESA-listed Steller's eiders. Across the non-breeding range, the Service has previously exempted the take of 0.93 eiders per year (see 4.6 Past and Present Consultations). We do not expect direct mortality due to this project and previously exempted take in the non-breeding range to meaningfully reduce the number of eiders returning to the breeding grounds and thus do not expect appreciable effects to the population.

The proposed project may also indirectly reduce eider numbers through increased, chronic disturbance from hunting and boating activities in Izembek Lagoon. In total, we estimate that between 5.19 and 15.08 percent of an eider's daytime fall hourly budget would be spent responding to disturbance during the fall (Table 14), a 2.53 to 2.94 increase from the current baseline. We expect disturbance will be variable across eider habitat in Izembek Lagoon and that these numbers are representative of areas experiencing the highest disturbance intensity in the fall (Figure 19). This level of disturbance would occur when 12 to 15 percent of the listed population is present for their approximately 3-week molt in the lagoon; molt is a particularly energetically costly life stage, and we predict disturbance would have higher consequences on overall fitness during this period. In addition to molting eiders, some portion of the overall wintering eider population (counted in February) would return to Izembek Lagoon during the fall when disturbance is estimated at its highest, exposing up to 52 percent of the listed entity to these heightened disturbance levels. In areas where hunting and boating disturbance overlaps with the 3 years of construction noise disturbance, disturbance levels could be slightly higher.

Table 14. Upper and lower estimates of effects of increased hunting and boating disturbance on brant in Izembek Complex, at different time periods. Lower historic disturbance estimates are based on 1985-1987 data, and all other values represent increases calculated per the details of Appendix A and Appendix B. Source: Ward et al. 1994

Hunting & Boating Disturbance	Flight Time Estimates (minutes/hour)		Disturbance Time estimates (minutes/hour)		Percent of Daytime Hourly Budget Responding to Disturbance (%)	
	Lower	Upper	Lower	Upper	Lower	Upper
Historic	0.07	0.19	0.14	0.34	0.23	0.57
Environmental Baseline	0.67	1.68	1.24	3.08	2.07	5.13
Condition After the Action	1.70	4.93	3.12	9.05	5.19	15.08

Repeated disturbance or large disturbance events could affect eiders by limiting feeding time and increasing energy expenditure, thereby reducing body condition. Reduced eider body condition would result in reduced survival during migration, as well as lowered resiliency in the face of stochastic events (i.e., high ice years). Models of brant, the best available proxy, indicate increased human disturbance alone in Izembek Lagoon of up to five times the rates used in their model (a threefold increase from historic levels) would not affect survival and emigration of brant (Stillman et al. 2021). We estimate baseline fall disturbance in Izembek Lagoon has increased threefold since the time period used for the Stillman model and we estimate the proposed action would cause an additional 2.53- to 2.94-fold increase. This is an approximate 7.62- to 8.82-fold total increase above the rates used to model disturbance to brant. Therefore, we expect the proposed action to affect the survival and emigration of some brant (and eiders by proxy) and thereby lower the numbers of the listed entity.

Any eiders exposed to disturbance at the rates estimated would experience adverse effects and potentially reduced survival, and up to 52 percent of the listed entity could be present and potentially experience these rates of increased disturbance. However, Steller’s eiders are distributed across the action area and experience disturbance at variable rates across Izembek Lagoon; it is unlikely all 52 percent of the listed entity would congregate in areas experiencing high hunting and boating rates. Given the ability of eiders to redistribute and move away from hunting activities and given that Steller’s eiders are not a target of hunters, we expect fewer than 52 percent of the listed entity would experience disturbance levels as calculated (Table 14). Brant are the best available proxy but because they are favored hunting targets, flocks of brant likely experience hunting disturbance at higher rates than flocks of Steller’s eiders, possibly resulting in an overestimate in disturbance to eiders. Some eiders likely experience disturbance at these rates if they are mixed with brant flocks; however, Steller’s eiders most commonly form dense single-species flocks. While some birds may experience disturbance levels exceeding the values modeling suggests could reduce survival and emigration (of brant), not all eiders would experience that level of effect in the Izembek Complex. We expect disturbance due to hunting and boating would be lower at all other times of the year; however, this does not include the additional potential disturbance due to off-road vehicle use in the area facilitated by the road.

Eiders may be able to shift to other preferred prey sites beyond locations of high hunting disturbance, such as areas in Norma Bay and/or near Neumann Island which may be less disturbed. However, reduced eider access to preferred habitat within Izembek Lagoon would be additive to existing, ongoing concerns such as changes to both eelgrass beds and prey biomass. In a winter study of common eiders in Greenland, days with high disturbance were followed by observations of nocturnal feeding, suggesting eiders can shift feeding timing to potentially accommodate disturbance, though it remains unclear if eiders are able to fully compensate with nocturnal feeding (Merkel et al. 2009). Given that migratory bird hunting is permitted one-half hour before sunrise and until sunset, human caused disturbance outside this time should be at much lower levels.

In the project area, eiders wintering in Cold Bay spent approximately 12.2 percent more time feeding and commensurately less time in comfort activities than eiders in Izembek Lagoon (Laubhan and Metzner 1999). During this study, eiders offset energetic requirements when Izembek Lagoon was unavailable by foraging in Cold Bay rather than minimizing energy expenditure by seeking thermal cover (Laubhan and Metzner 1999). While eiders are generally thought to have low flexibility in their daily budget (Goudie and Ankney 1986), within this area Steller's eiders may have some flexibility to a) adjust their time budget per activity, b) move to alternate feeding grounds, and/or c) shift spatiotemporally; which is relevant should disturbance rise to the level that they temporarily flee their preferred habitat.

We expect a 2.53- to 2.94-fold increase in disturbance above current levels, likely increasing to reach these levels over the lifetime of the road. This results in an estimated 5.19 to 15.08 percent of an eiders daytime hourly budget spent responding to disturbance. We also expect disturbance to be variable year to year. If years with disturbance levels toward our upper estimates (representing a loosening of hunting regulations and high levels of commercial guiding) overlap with high ice years, we expect loss of eiders. In years with disturbance levels toward our lower estimates (representing tighter hunting regulations [the current norm] and average levels of commercial guiding), we expect the 5 percent change in daily budget to be tolerable to eiders and minimal to no impact on eider numbers. In summary, given that eiders can move away from disturbance, are not direct targets of hunting, tolerate high levels of disturbance at other sites (such as Unalaska and Women's Bay), may accommodate adjustments in their daily budget by site (Laubahn and Metzner 1999), and given that our disturbance estimates represent the highest level of disturbance expected only within a discrete area of Izembek Lagoon, we anticipate disturbance to have an adverse effect on eider numbers but we do not expect it to appreciably reduce survival or recovery of the listed entity.

<u>Distribution</u>

Most activities evaluated are already ongoing, as described in the Environmental Baseline; we anticipate increases in these activities, proportional to the level of increased access. Hunting (both subsistence and sport), fishing, and other vessel use have occurred through the Izembek Complex for decades. Despite these activities, Steller's eiders, including the Alaska-breeding population, continue to consistently use the action area for molting, wintering, and spring staging.

We anticipate an increase in both the intensity and distribution of boating and hunting disturbance within Izembek Lagoon over the lifetime of the road, as well as a smaller, temporary increase in noise disturbance during the 3 years of construction. This increase in disturbance would cause some Steller's eiders to temporarily shift their location within Izembek Lagoon or even flee the lagoon altogether. We expect the disturbance intensity to be highest during the fall hunt and less during the other times of year when eiders are present. If eiders flee their preferred habitat in Izembek Lagoon during the fall hunt, they could reoccupy this habitat during wintering and spring staging. While some eiders would likely temporarily choose to shift to other locations that may be lower quality when disturbed, these shifts are not expected to change the distribution of the population as a whole.

Reproduction

Steller's eiders do not nest in the action area; therefore, we expect no direct loss of reproductive success. We expect only a small number of individuals will be killed, injured, or suffer sufficient reduction in fitness to have decreased survival, resulting in minimal change to the breeding population. We do not expect the mortality of a small number of individuals to have appreciable effects on reproduction. Increased disturbance would adversely affect some individuals to the point of reduced fitness and therefore may potentially remove them from the reproductive population within a given year (i.e., the individual does not migrate to breeding grounds or does not breed successfully) or entirely (i.e., death). We expect effects of the action from disturbance to be lower (relative to the rates in Table 14) during the spring when courtship behaviors are occurring. Additional applicant-proposed project specific conservation measures to avoid construction related disturbance during the courtship period will further reduce the likelihood of reproductive impacts (see 1.5 Conservation Measures).

Overall, we anticipate activities associated with the proposed action will result in a minor reduction in reproduction and productivity, through the loss of a small number of individuals and a minimal disruption of courtship behaviors. Thus, we conclude the effects of the action will not result in an appreciable reduction in reproduction for the Alaska-breeding Steller's eider.

Recovery

The natural recovery rate of Steller's eiders is not known. Long-lived species with low annual fecundity have a relatively slow recovery rate compared to short-lived species with high annual fecundity. Given the Steller's eider's observed low fecundity (i.e., small clutch sizes, high variability in nesting attempts, and generally low nest success; Quakenbush et al. 1995), the recovery rate for this species is believed to be quite slow. We expect some number of Steller's eiders in Izembek Lagoon would experience adverse effects in most years. However, we anticipate only a small number of individuals would suffer injury or death; as discussed above, the anticipated losses would represent only a fraction of 1 percent (i.e., less than 1 percent) of the population per year. Furthermore, we expect only a small proportion would suffer a reduction in reproductive success. Based on the minimal extent of these expected effects, we conclude this would not appreciably reduce the likelihood of recovery of the species.

When considering effects from the proposed action in combination with cumulative effects, any future activities with the potential for significant effects are likely to have a Federal nexus and therefore will require a separate section 7 consultation. Other smaller scale activities, which may not have a Federal nexus, are likely to have minor impacts on Alaska-breeding Steller's eiders and therefore would not make a significant contribution to cumulative effects.

Steller's eiders in the action area would also continue to experience ongoing threats and emerging threats in addition to those caused by the proposed action. These threats include but are not limited to climate change, disease, stochastic events (such as extreme icing years along the isthmus), and changes to eelgrass and prey species (see 3.1 Status of the Species and 4.1, 4.2 Environmental Baseline). Together, the effects of the action and these other threats would produce synergistic effects to eiders that are likely to increase over time. We expect years with high levels of all threats, such as disease outbreak or extreme ice coverage, and high levels of disturbance to result in loss of eiders. Any eiders with lower body condition due to the effect of the action would be less tolerant to additional stressors (such as ice over of preferred prey sites). Further, any eiders arriving in Izembek Complex in poor body condition would be less able to tolerate existing stressors and the additional effects caused by the action. The population has low resiliency, as low numbers of Steller's eiders are annually present in Alaska and have highly variable vital rates, and low redundancy, as only one extant subpopulation remains with a wide but sparse distribution outside of Utqiaġvik. While the population has moderate representation indicated by their varied diet and habitat use, adequate genetic diversity, and wide non-breeding distribution, the population remains vulnerable to environmental stochasticity and catastrophic events. Additionally, the identified stressors to the population are likely to worsen over time in both the breeding and nonbreeding habitats (USFWS 2025b). However, we do not expect this loss to appreciably impact the numbers, reproduction, or distribution of Steller's eiders as we expect only a small proportion of the Alaska breeding Steller's eiders would be affected in most years.

Jeopardy Conclusion

Our jeopardy analysis relied on four components: (1) Status of the Species, (2) Environmental Baseline, (3) Effects of the Action, and (4) Cumulative Effects. After reviewing the current status of the species, the environmental baseline for the action area, the effects of the proposed action, and the cumulative effects, it is our biological opinion that the action, as proposed, is not likely to jeopardize the continued existence of the Alaska-breeding Steller's eider.

7.2 Steller's Eider Designated Critical Habitat

The proposed action, construction of a road, would alter some critical habitat in the action area. Disturbance to PCEs during construction, through sedimentation and turbidity, would be localized and mostly temporary. Construction of the road would also permanently alter local hydrology, modifying input into Izembek Lagoon and affecting the associated PCEs (eelgrass, marine waters and benthic substrates, and macroinvertebrate prey species). After road construction, we expect ongoing impacts to PCEs (eelgrass, the water column and benthic substrates, and macroinvertebrate prey species) for the foreseeable future. Contaminants are expected to be introduced to the system through accidental, small spills; the exact quantity and location of these spills cannot be predicted. This increase in effects, combined with ongoing threats identified in the baseline, would increase the overall stress on PCEs in the Izembek Lagoon critical habitat unit, decreasing the quantity and quality of eelgrass and macroinvertebrate prey species in localized areas of Izembek Lagoon. These effects would be additive to existing stressors on PCEs in Izembek Lagoon, which have resulted in a measurable loss of eelgrass habitat and a measurable reduction in the overall biomass of certain invertebrate prey species on which eiders rely. However, the combined effects to PCEs would affect a relatively small portion of overall critical habitat within Izembek Lagoon and would not reduce the ability of Alaska-breeding Steller's eider critical habitat to provide for the recovery of Alaska-breeding Steller's eiders. Therefore, we conclude that the direct and indirect alteration of critical habitat in the action area would not appreciably diminish the value of critical habitat in the action area for conservation of the Alaska-breeding Steller's eider.

After reviewing the current status of the critical habitat of Alaska-breeding Steller's eiders, the environmental baseline of critical habitat for the action area, the effects of the proposed action on critical habitat, and the cumulative effects, it is the Service's biological opinion that proposed action is not likely to result in the destruction or adverse modification of critical habitat of the Alaska-breeding Steller's eider.

7.3 Southwest Alaska DPS of Northern Sea Otter

Construction of the proposed road and increased access of the area after construction would impact sea otters. We expect the primary effects to sea otters would be disturbance via behavioral changes caused by increased human and vessel activity after road construction, and harm via vessel strike due to increased vessel traffic after the road is built. We expect impacts to habitat would also affect sea otters.

Numbers

We expect few sea otters would be permanently removed from the population by the effects of the action and that the number of individuals permanently removed would be relatively small compared to the entire population. We estimate up to three sea otters a year from the Bristol Bay MU would experience injury or death via vessel strike after the road is constructed for the foreseeable future and up to five a year would be removed due to increased harvest in Izembek Lagoon. This would represent a loss of only a fraction of 1 percent (i.e., less than 1 percent) of the Bristol Bay MU population per year. We also estimate a small number of sea otters would experience disturbance from increased human activities after the road is constructed (see section 5.5.1), although this number is expected to be low relative to the number of sea otters in the action area. The number of sea otters that would experience disturbance is expected to decrease over time as individuals move away from high disturbance areas or acclimate to new levels of disturbance. Therefore, we do not expect any appreciable change in population numbers from the disturbance, injury, or mortality of listed sea otters caused by project activities.

Reproduction

We expect some mothers with pups would be affected by the effects of the action discussed above if they are unable to leave the area or acclimate to increased disturbance and therefore experience increased and repeated stress. We expect only a small number of mothers would be affected and that any impact to reproduction would not be measurable. Population level changes to sea otter reproduction are not expected because any impacts would be small enough they would be difficult to measure due to the relatively high number of sea otters in the action area. We do not expect an appreciable reduction in reproduction for the southwest DPS of northern sea otters.

Distribution

The effects of the action are unlikely to impact the distribution of the southwest DPS of northern sea otters because they are widely distributed across southwest Alaska. Any impacts to distribution would be localized, limited to Izembek Lagoon, Kinzarof Lagoon, and/or Cold Bay and attributable to sea otter avoidance of the action area due to increased disturbance.

Recovery

The relatively small number of listed sea otters disturbed, injured, or killed by the effects of the action is not expected to affect the recovery of the southwest Alaska DPS of northern sea otters due to their relatively high abundance and wide distribution across their range. We expect most, if not all, disturbance, injury, or death to sea otters would occur in Izembek Lagoon in the Bristol Bay MU, which has a moderate population size and thus has more resiliency to withstand impacts over time. We anticipate limited impact to the South Alaska Peninsula MU, which has a small population size and low resiliency, because most effects of the action would occur outside of this MU. Therefore, we do not expect effects of the proposed action to be large enough to appreciably detract from the recovery objectives and criteria for the entire southwest Alaska DPS of northern sea otter.

Northern sea otters in the action area would also continue to experience ongoing threats and emerging threats in addition to the effects of the action. These threats include but are not limited to climate change, disease, stochastic events (such as extreme icing years along the isthmus), and changes to prey species (see 3.3 Status of the Species and 4.1, 4.4 Environmental Baseline). Together, the effects of the action and these other threats would produce synergistic effects to sea otters that are likely to increase over time. However, the Bristol Bay MU is predicted to have overall moderate resiliency into the future, even with changing climate and increased stressors (USFWS 2020). Additionally, we have no data to indicate that ongoing threats are currently large enough to appreciably impact the numbers, reproduction, or distribution of the Bristol Bay MU.

Jeopardy Conclusion

Our jeopardy analysis relied on four components: (1) Status of the Species, (2) Environmental Baseline, (3) Effects of the Action, and (4) Cumulative Effects. After reviewing the current status of the species, the environmental baseline for the action area, the effects of the proposed action and the cumulative effects, it is our biological opinion that the action, as proposed, is not likely to jeopardize the continued existence of the southwest DPS of northern sea otter.

7.4 Designated Critical Habitat for Northern Sea Otters

The proposed action, construction of a road, would alter some critical habitat in the action area. Disturbance to PCEs during construction, through sedimentation and turbidity, would be localized and mostly temporary. Construction of the road would also permanently alter local hydrology, modifying input into the lagoons and affecting the associated PCEs (kelp and macroinvertebrate prey species). After road construction, we expect ongoing impacts to PCEs from sedimentation and turbidity for the foreseeable future. This increase in effects combined with ongoing threats identified in the baseline (i.e., climate change, existing contaminated sites, ongoing human activities that contribute to sedimentation, etc.) would increase the overall stress on PCEs and decrease the quantity and quality of PCEs in the action area. Contaminants are expected to be introduced to the system through accidental, small spills; the exact quantity and location of these spills cannot be predicted. This increase in effects, combined with ongoing threats identified in the baseline, would increase the overall stress on PCEs in the action area, decreasing the quantity and quality of kelp and macroinvertebrate prey species in localized areas of Izembek Lagoon, Kinzarof Lagoon, and Cold Bay. These effects would be additive to existing stressors on PCEs, which have resulted in a measurable reduction in the overall biomass of certain invertebrate prey species on which sea otters rely. The combined effects to PCEs would affect a relatively small portion of overall critical habitat. We anticipate the combined effects to PCEs would not reduce the ability of critical habitat to provide for the recovery of northern sea otters as effects of the action would affect a relatively small portion of overall critical habitat limited to Izembek Lagoon, Kinzarof Lagoon, and Cold Bay (see Figure 11 and Figure 24). Therefore, we conclude that direct and indirect alteration of critical habitat would not appreciably diminish the value of critical habitat in the action area for the conservation of northern sea otters.

After reviewing the current status of the critical habitat of northern sea otter, the environmental baseline of critical habitat for the action area, the effects of the proposed action on critical habitat, and the cumulative effects, it is the Service's biological opinion that proposed action is not likely to result in the destruction or adverse modification of critical habitat of the southwest DPS of northern sea otter.

7.5 Jeopardy and Destruction/Adverse Modification Conclusions

It is the Service’s biological opinion that the Proposed Action is not likely to jeopardize the continued existence of the Alaska-breeding Steller’s eider or southwest Alaska DPS northern sea otter and is not likely to destroy or adversely modify designated critical habitat for the Alaska-breeding Steller’s eider or southwest DPS northern sea otter.

8 INCIDENTAL TAKE STATEMENT

Section 9 of the ESA and federal regulation pursuant to section 4(d) of the ESA prohibit the take of endangered and threatened species, respectively, without special exemption. Take is defined as to harass, harm, pursue, hunt, shoot, wound, kill, trap, capture or collect, or attempt to engage in any such conduct. “Harass” is defined by the Service as intentional or negligent actions that create the likelihood of injury to listed species by annoying them to such an extent as to significantly disrupt normal behavior patterns that include, but are not limited to, breeding, feeding or sheltering. Incidental take refers to takings that result from, but are not the purpose of, carrying out an otherwise lawful activity conducted by the Federal agency or applicant (50 CFR 402.02). Under the terms of section 7(b)(4) and section 7(o)(2), taking that is incidental to and not intended as part of the agency action is not considered to be prohibited taking under the ESA provided that such taking is in compliance with the terms and conditions of this Incidental Take Statement (ITS).

The regulations implementing the incidental take provisions of section 7(a)(2) of the ESA specify that the Service formulates an Incidental Take Statement “…if such take is reasonably certain to occur.” 50 CFR 402.14(g)(7). The Service continues to rely on the best available scientific and commercial data, as well as professional judgment, in reaching these determinations and resolving uncertainties or information gaps.

The USACE has a continuing duty to regulate the activity covered by this incidental take statement. In order to monitor the impact of incidental take, the USACE must report the progress of the action and its impact on the species to the Service as specified in the incidental take statement. [50 CFR 402.14(i)(4)].

This Incidental Take Statement is limited to otherwise lawful activities; therefore, take caused by oil spills, which are not lawful activities, are not included here and are not exempted from the prohibitions of section 9 of the ESA.

8.1 Amount of Take

8.1.1 *Steller’s Eider*

Construction (Years 1-3)

The Service anticipates that one Alaska-breeding Steller’s eider would be taken as a result of road construction. The incidental take is expected to be in the form of harm via injury or death as a result of collision with temporary vertical structures during construction. As explained in the Effects of the Action (section 5.2.3.2), we relied on calculations of collision risk in the area to estimate the anticipated number of impacted eiders. Due to the implementation of project specific conservation measures, we expect the likelihood of strike to be toward lower estimates, resulting in a total of one eider taken over the 3-year construction period. If more than one Steller’s eider is taken because of collision during the 3 years of construction, reinitiation will be required pursuant to 50 CFR 402.16.

We do not expect any Steller's eiders would be disturbed by increased noise levels during road construction activities to the point where they would experience take in the form of harassment.

Maintenance

Beyond construction, the Service does not anticipate take of Alaska-breeding Steller's eiders in the form of harm to be caused by maintenance of the road during its 50-year lifetime. The Service also does not anticipate any Steller's eiders would be disturbed by increased noise levels during road maintenance activities to the point where they would experience take in the form of harassment.

Road-Use (Years 4-53)

We currently have no evidence to indicate that vehicles are a collision risk to Steller's eiders; thus, this was not analyzed as a likely source of injury or mortality in the project effects. We conclude there would be no incidental take caused by vehicle collision.

The Service anticipates take of Alaska-breeding Steller's eiders through the indirect effects of road-use over its 50-year lifetime. We anticipate incidental take in the form of harm through increased inadvertent harvest of eiders and harassment through disturbance caused by increased hunting and boating activities facilitated by the road. Harassment due to increased hunting and boating disturbance would rise to the level of harm for some eiders, resulting in reduced fitness, survival, and reproductive success. These activities occur later in time and are reasonably certain to occur.

We estimate a 2.53- to 2.94-fold increase in hunting and boating disturbance in Izembek Lagoon over 50-years due to the effects of the action. Using data on brant (the best available proxy), we further estimate that Steller's eiders exposed to both hunting and boating disturbance would spend a total of 5.19 to 15.08 percent of their daytime daily budget responding to hunting and boating disturbance after the action. Therefore, the effect of the action would cause a 3.12 to 9.95 percent increase in eider disturbance relative to baseline conditions (Table 14). We estimate collisions with vessels would occur as often as once every 8.33 years (upper estimate), or six eiders over the 50-year lifetime of the road. We also anticipate the rate of inadvertent harvest of Steller's eiders (including wound loss) would increase from one every 38.5 years to one every 10 years in the action area, or five eiders over the 50-year lifetime of the road. While we anticipate these indirect effects, these forms of take would not be reliably monitored or detected and so we use a surrogate to measure incidental take, as described below.

In accordance with 50 CFR 402.14(i)(1)(i), a surrogate may be used to express the amount or extent of anticipated incidental take if the biological opinion or Incidental Take Statement describes the causal link between the surrogate and anticipated take, explains why it is not practical to express the amount or extent of anticipated take or to monitor take-related impacts in terms of individuals, and sets a clear standard for determining when the level of anticipated take has been exceeded.

It is difficult to directly measure or monitor at the individual level the increase in inadvertent harvest and disturbance of Alaska-breeding Steller's eiders caused by the increased access to the lagoon facilitated by the road. The Service's analysis relies on brant as the best available proxy, which is acknowledged as an imperfect proxy for various reasons, including brant being a species targeted for hunting while Steller's eiders are not. We lack information specific to Steller's eiders; for example, we do not have a direct causal relationship between what amount of individual disturbance would lead to a quantifiable amount of harassment (i.e., significantly disrupting normal behavioral patterns) and at what frequency and magnitude any such harassment will lead to harm via injury or death through reduced fitness. Therefore, while we anticipate incidental take in the form of harm and harassment from increased hunting activities in Izembek Lagoon, it is difficult to determine the number of individuals that could be injured or killed. Steller's eider presence can substantially vary on an annual basis and is spatially and temporally variable within Izembek Lagoon in relation to hunting activities.

A surrogate is used for incidental take associated with road-use because, as described throughout this biological opinion, it is difficult to accurately quantify and monitor the number of individual eiders that will be incidentally taken as a result of road use. Large fractions of the incidental take of Steller's eiders (such as inadvertent harvest through direct mortality and/or wound loss; vessel strike; or disturbance from hunting, boats, and off-road vehicles) are not readily detectable. For example, wound loss of birds by hunters cannot be readily detected during hunts and, if detected, some hunters may be reluctant to report (Rothe et al. 2015). Other relevant factors include variability associated with spatial and temporal timing of Steller's eider migration and molt, changes to molting location preference through time (i.e., shift in space beyond the project area), variability in population of the Alaska-breeding population and Russian-breeding populations of Steller's eiders influencing the ability to quantify the effect to the listed entity versus pacific-wintering population, and variability in how individual animals use habitat within the action area.

Therefore, we use human-use condition associated with take, measured in Client Use Days (CUDs), as the incidental take surrogate for Alaska-breeding Steller's eider. CUDs are the best available surrogate for incidental take associated with road-use because they directly reflect the effort of commercially guided waterfowl harvest, which comprises the majority of the anticipated increase in hunting and boating disturbance due to the effect of the action. Hunting effort in Izembek Lagoon can be monitored using CUDs, defined as the number of days a hunter was taken on the Refuge by a commercial guide. CUDs are used throughout this document to measure changes in hunting intensity through time. This annually reported data provides a consistent, repeatable, monitorable measure of changes in hunting effort, and therefore inadvertent harvest and disturbance of eiders, in Izembek Lagoon. Any increase or decrease in CUDs leads to an associated increase or decrease in hunting-caused harm and harassment. Therefore, we assess that the incidental take of Steller's eider will be exceeded if the total CUDs on Izembek Refuge exceed 1,735 days in any fall hunting season (the upper estimate of change estimated in this analysis, see Appendix A), because that indicates more hunting (and therefore more harm and harassment of listed Steller's eiders through inadvertent harvest and disturbance) is occurring than anticipated. If this surrogate threshold is exceeded, the amount or extent of the anticipated level of incidental take will be considered exceeded and reinitiation will be required pursuant to 50 CFR 402.16.

We recognize that there has been an increasing trend in hunting in the last two decades and it would be challenging to determine the level of increase attributable solely to the proposed action.

Additionally, not all CUDs may derive from hunting in Izembek Lagoon (e.g., could include hunting in freshwater ponds or upland habitats); however, because it is a premier waterfowl hunting destination, we expect the majority of hunting effort to occur in Izembek Lagoon. Acknowledging these factors, CUDs remain our best estimate to measure the increase in hunting activity that is anticipated due to the proposed action.

There is no annually reported data on subsistence harvest of waterfowl in the area to include as an additional surrogate. While CUDs may not directly account for changes in subsistence harvest in Izembek Lagoon, they do act as a reasonable proxy for overall hunting effort in the area because CUDs are responsive to fall hunting regulation changes. For example, CUDs decreased 29 percent in 2025 due to more restrictive hunting regulations (shortening the brant hunting season by 1 month) relative to the prior year. This is important because it demonstrates the CUDs detect annual variation and serves as a meaningful threshold for monitoring incidental take related to hunting. This responsiveness to regulation also captures changes in the fall general hunt which influence both resident and non-resident hunters. In the Aleutian Pribilof Islands region, all inadvertent Steller's eider harvest was reported in the fall-winter general hunt and none was reported during the spring subsistence hunt (Naves and Schamber 2024). Thus, the best available data on Steller's eider harvest indicates the fall hunt is the period where most take in the form of inadvertent harvest occurs and our surrogate is responsive to change during this period. Therefore, regulation-driven changes in subsistence harvest will likely mirror CUDs.

We considered numerous options for incidental take surrogates, and we determined CUDs to be the best available surrogate because it directly measures the intensity of the primary stressor (hunting activity) and is regularly reported (annual data) from which incidental take can be monitored and reinitiation can be triggered. Other options considered but not carried forward include the following:

- Reports of Steller's eider harvest
    - As described in sections 4.2.4.1 Harvest of Steller's Eiders and 5.2.2 Harvest of Steller's Eiders, inadvertent harvest of Steller's eiders frequently goes undetected and is underreported. Therefore, reports of inadvertent eider harvest would not be a reliable standard for measuring incidental take.
- Boat launch use data
    - The boat launch is not under the jurisdiction of the USACE or ADOT&PF and no existing monitoring of use occurs.
- Potential future studies of disturbance
    - There is no guarantee that disturbance studies similar to Ward et al. 1994 will be conducted by the Refuge at regular intervals. Therefore, using potential disturbance monitoring as a trigger would not be a regular, reliable standard for measuring incidental take.
- Pounds of ducks harvested in Cold Bay and King Cove
    - ADF&G subsistence reports quantify the pounds of ducks harvested by communities across Alaska. However, these reports are not regularly occurring. The most recent two reports were in 1992 and 2016. Therefore, it is not a regularly monitorable standard for tracking incidental take compared to the annually reported CUDs data.

8.1.2 Northern Sea Otter

Construction & Maintenance
The Service does not anticipate any incidental take of northern sea otters due to road construction and maintenance activities.

Road-Use (Years 4-53)
The Service anticipates take of northern sea otters through the indirect effects of road-use over its 50-year lifetime from vessel collisions, disturbances caused by vessels, and increased harvest. We estimate otter-vessel collisions would result in the injury or death of up to three otters per year in Izembek Lagoon (as estimated in section 5.4.2). We anticipate additional disturbance caused by increased hunting and boating activities facilitated by the road would lead to increased stress and energy deficits and therefore reduced fitness for a small number of individuals. This incidental take is expected to be in the form of harassment via significant disruptions to normal behaviors. These activities occur later in time and are reasonably certain to occur. While we anticipate these indirect effects, these forms of take would not be reliably monitored or detected and so we use a surrogate to measure incidental take, as described below.

As established for Steller's eiders above, it is appropriate to use surrogates for incidental take caused by vessel collisions and disturbances from vessels in Izembek Lagoon. Vessel disturbance of sea otters and vessel strike are difficult to detect and reliably monitor without consistent and frequent observation. In this document, we anticipate changes in hunting activities to be the primary driver of increased boat-based disturbance in Izembek Lagoon. Therefore, using waterfowl hunting CUDs as a surrogate for incidental take for sea otters would provide a proxy for this effect. Any increase or decrease in CUDs leads to an associated increase or decrease in hunting-derived harm and harassment. The incidental take of northern sea otter will be exceeded if the total CUDs on Izembek Refuge exceed 1,735 days in any fall hunting season (the upper estimate of this analysis, see Appendix A). If CUDs exceed 1,735 days, it indicates more hunting (and therefore more harm and harassment of otters through hunting-caused disturbance) is occurring than anticipated. If this surrogate threshold is exceeded, the amount or extent of the anticipated level of incidental take will be considered exceeded and reinitiation will be required pursuant to 50 CFR 402.16.

In addition, we anticipate take in the form of harm through increased harvest of sea otters in Izembek Lagoon. Because harvest of sea otters is reported and tracked by the Service's MTRP, we use these data to estimate take via harvest rather than the above surrogate. We anticipate up to five sea otters a year would be taken in Izembek Lagoon via harvest as an effect of the action.

However, take caused by subsistence harvest is directed and intentional take, rather than incidental take, because the purpose of the act is to harvest sea otters. This distinguishes harvest from acts encompassed by the definition of "incidental take" provided by Service regulations implementing section 7 of the ESA. *See* 50 CFR § 402.02. Treating harvest take as incidental take would also result in misapplications of the incidental take provisions of section 7(b)(4) of the ESA and the Service's implementing regulations at 50 CFR § 402.14(i). Where marine mammals such as sea otters are concerned, these provisions require the Service to provide an ITS only when the anticipated taking is authorized pursuant to Section 101(a)(5) of the Marine

Mammal Protection Act (MMPA). Those MMPA provisions address “incidental, and not intentional, taking” and, as the Service has long recognized, do not facilitate the authorization of take resulting from intentional acts (16 USC § 1371(a)(5)(A)(i) and (D)(i); *see also* 50 CFR § 18.34 and explanatory discussion at 75 Fed. Reg. 61631, 61633). Since intentional take cannot be authorized under Section 101(a)(5) of the MMPA, it falls outside the purview of section 7(b)(4) and 50 CFR § 402.14(i)(1) and does not support the inclusion of certain required ITS components, i.e., reasonable and prudent measures, terms and conditions, and measures to comply with Section 101(a)(5) of the MMPA. Treating harvest take as intentional take, and not incidental take, gives proper effect to the ESA and its implementing regulations and preserves consistency in the meaning of “incidental take” under the ESA and MMPA. Additionally, both the ESA (section 10(e)) and the MMPA (section 101(b)) provide exemptions to the taking of sea otters for subsistence purposes or the creation of native handicrafts.

8.1.2.1 Authorization of Take

This biological opinion and associated Incidental Take Statement are only valid when paired with an accompanying Incidental Harassment Authorization to allow harassment of northern sea otters pursuant to the Marine Mammal Protection Act of 1972 (16 U.S.C. 1361 et seq). The Service is not including an incidental take authorization for marine mammals at this time because the incidental take of marine mammals has not been authorized under section 101(a)(5) of the MMPA as amended. Following issuance of such regulations or authorizations, the Service may amend this biological opinion to include an incidental take statement for marine mammals, as appropriate.

The Service can authorize MMPA incidental take through two mechanisms provided within section 101(a)(5) of the MMPA. The first is through promulgation of incidental take regulations (ITRs) and associated Letters of Authorization (LOA). See 16 USC § 1371(a)(5)(A), 50 CFR § 18.27(f). The second is through issuance of Incidental Harassment Authorizations (IHA). See 16 USC § 1371(a)(5)(D). The MMPA prescribes a 5-year limit for ITRs (and, by extension, associated LOAs) and a 1-year limit for IHAs. See 16 USC 1371(a)(5)(A)(i)(I) and (D)(i), respectively. Thus, it is not possible for the Service to issue an MMPA incidental take authorization applicable to the entirety of this 53-year proposed action. When the Service updated its ESA section 7 consultation regulations to implement amendments to the MMPA, which provided a mechanism for allowing certain taking of ESA-listed species, it offered “options on how to handle the timing discrepancies between the two Acts.” 54 FR 40,346. The Ninth Circuit Court of Appeals has summarized these options as follows:

> First, the action agency may consider initiating the MMPA process in advance of the ESA section 7 process. The MMPA requirements can then be incorporated into the ESA incidental take statement when the biological opinion is issued and subsequent revisions would not be necessary. Second, FWS and the Action Agency may together agree to extend the section 7 consultation under the ESA to accommodate completion of the MMPA regulations. Or, third, the Action Agency may begin early consultation with the ESA, and request a preliminary biological opinion. Once the MMPA process is completed, the opinion would be reviewed and the ... incidental take statement amended

> or added, as appropriate. *Center for Biological Diversity v. Bernhardt*, 982 F.3d 723, footnote 8 (9th Cir. 2020) (internal quotations and citations omitted).

Since MMPA incidental take authorization does not yet exist for this proposed action, the Service will address MMPA incidental take authorizations issued for the proposed project using an approach consistent with Option 3. More specifically, the Service will review this Biological Opinion and amend its contents, as appropriate, in light of the findings made and requirements imposed by each subsequent MMPA incidental take authorization process concerning this proposed project.

Effect of the Take

In this Biological Opinion, we determined that the level of anticipated take is not likely to result in jeopardy to the species. Although we anticipate some incidental take to occur, the implementation of the conservation measures proposed would result in avoidance and minimization of adverse effects.

8.2 Reasonable and Prudent Measures

The measures described below are non-discretionary and must be undertaken by the USACE or made binding conditions of any permit issued to the ADOT&PF or other applicants, permittees, or contractors, as appropriate, for the exemption in section 7(o)(2) to apply. The USACE has a continuing duty to regulate the activity covered by this Incidental Take Statement. If the USACE (1) fails to assume and implement the terms and conditions or (2) fails to require the applicant or other contractors to adhere to the terms and conditions of the ITS through enforceable terms that are added to permit or agreements, the protective coverage of section 7(o)(2) may lapse. To monitor the impact of incidental take, the USACE must report the progress of the action and its impact on the species to the Service as specified in the ITS [50 CFR 402.14(i)(3)].

The Service considers the following reasonable and prudent measures (RPMs) to be necessary and appropriate to minimize the impacts of the incidental take of Steller’s eiders and northern sea otters.

> **RPM 1**: Ensure take is commensurate with the effects analysis of this Biological Opinion.

8.3 Terms and Conditions

In order to be exempt from the prohibitions of section 9 of the ESA, the USACE must comply with the following terms and conditions (T&C), which implement the RPM described above. These terms and conditions are non-discretionary.

> **T&C 1**: To ensure take resulting from the proposed action is consistent with the analysis contained in this biological opinion, the USACE must complete mandatory incidental take monitoring over the lifetime of the road (details provided in section 8.4, below). The USACE may delegate authority to the project applicant or permittee. If entering into or amending any agreements for the maintenance of the road or if acquiring or conveying any

right-of-way or other interest in the road, USACE and/or the applicant/permittee must include incidental take monitoring as a binding commitment within any such agreement. The USACE must notify the Service in the event the permit is transferred to another entity.

T&C 2: The USACE and applicant/permittee will work with the Service to develop and install appropriate signage along the road regarding the presence of listed species in the area and means to avoid and minimize impacts to listed species. Signage will inform the public of the sensitivity and importance of the surrounding habitats to disturbance (including boat and ATV-use) and measures to maintain ecological integrity of the area.

8.4 Monitoring and Reporting Requirements

Pursuant to 50 CFR 402.14(i)(4), the USACE must report the progress of the action and its impact on the species to the Service as specified in this Incidental Take Statement.

The USACE (and/or the project applicant/permittee per T&C 1, above) will submit an annual report to the Southern Alaska Fish and Wildlife Field Office via email at *ak_fisheries@fws*.gov by February 1 of the following year, for the duration of the project. The reports shall include (1) observations or interactions with Steller's eiders or northern sea otters within the road corridor, (2) any take of Steller's eiders or northern sea otters associated with the project, and (3) annual reports of CUDs (received through requests to Izembek National Wildlife Refuge). These monitoring requirements will ensure take is commensurate with anticipated levels from both direct (construction) and indirect (road-use and increased activity associated with road-use; using CUDs as a surrogate in the broader action area) effects of the action.

The USACE or applicant/permittee will also submit a draft report by email to the Southern Alaska Fish and Wildlife Field Office general delivery mailbox at *ak_fisheries@fws*.gov no later than 90 days following the end of construction activities. The USACE or applicant/permittee will provide a final report within 30 days following resolution of the Service's comments on the draft report. If no comments are received from the Service within 30 days, the draft report will be considered the final report. The report will summarize all construction activities associated with the proposed action, and any observations, interactions, or take of Steller's eiders or northern sea otters.

The USACE or the applicant/permittee must submit a written report, such as by email, within 24 hours for any notable event including injury or mortality of a listed species, biologically important observations associated with a listed species, etc.

Reports submitted to the Southern Alaska Fish and Wildlife Field Office general delivery mailbox at *ak_fisheries@fws*.gov. Please include the consultation number (2026-0057356) in the subject line of the correspondence. Notable events include, but are not limited to:

- Any injury or mortality to a listed species (including ANY Steller's eider collisions with vertical structures, vessels, or vehicles).
- Observation of large rafts (40 individuals or more) of northern sea otters in proximity to project activities.

- Occurrence of any spill of a size greater than 50 barrels that occurs during construction or maintenance activities.

In particular, the applicant/permittee must report any sea otter or Steller's eider collisions with vertical structures or vehicles within the road corridor or with vessels in the action area to the USACE, which will then provide these encounter reports to the Southern Alaska Fish and Wildlife Field Office within 24 hours. Minimum information for collision encounter reporting will include species, date/time, location, weather, identification of the structure, vessel, or vehicle involved and its operational status when the encounter occurred, and one or more photographs (or a statement explaining why obtaining a photograph of any particular sea otter or Steller's eider was not possible). The Southern Alaska Fish and Wildlife Field Office should be contacted regarding the recovery or transport of dead northern sea otters or Steller's eiders.

The reporting of CUDs is consistent with our use of that metric as a surrogate measure of human activities that may cause disturbance events to eiders and otters throughout the Action Area, as detailed in the Incidental Take Statement. The CUDs data are collected annually by Izembek NWR; all commercial operators (guides, air/water taxis, outfitters) are required to log their CUDs and submit a report to the Izembek NWR Refuge Manager no later than December 31 each year. The USACE or the applicant/permittee should obtain a copy of the CUD report from Izembek NWR (via phone at 907-532-2445 or email at *Izembek@fws.gov*) during January of each year.

8.4.1 Disposition Of Dead or Injured Specimens

The Service is to be notified within 3 working days upon locating a dead, injured, or sick Steller's eider, northern sea otter, or other endangered or threatened species specimen within the Action Area (50 CFR 402.14(i)(1)(v)). The finding of dead specimens does not imply enforcement proceedings pursuant to the ESA. The reporting of dead specimens is required to enable the Service to determine if take is reached or exceeded and to ensure that the terms and conditions are appropriate and effective. Initial notification must be made to the nearest Service Law Enforcement Office at 907-786-3992 and by telephone and in writing to the Southern Alaska Fish and Wildlife Field Office (907-743-9173; *ak_fisheries@fws.gov*). The report must include the date, time, precise location of the injured animal or carcass, a photograph, cause of death or injury, if known, and any other pertinent information. Care should be taken in handling sick or injured specimens to preserve biological materials in the best possible state for later analysis of cause of death, if that occurs. In conjunction with the care of sick or injured endangered or threatened species or preservation of biological materials from a dead animal, the finder has the responsibility to ensure that evidence associated with the specimen is not unnecessarily disturbed. If the carcass is reasonably fresh (not in an advanced state of decay), a reasonable effort should be made to recover it and keep in cold storage (refrigerated or frozen, wrapped in paper and not plastic) until the Southern Alaska Fish and Wildlife Field Office can be contacted.

If an injured or sick northern sea otter or Steller's eider is observed, call the Alaska Sea Life Center stranded animal hotline at 1-888-774-7325. Then inform the Service's Anchorage Law Enforcement Office at 907-786-3992. The USACE, or the applicant must take care in handling injured animals to ensure effective treatment and care, and in handling dead specimens to preserve biological material in the best possible state. The USACE, or the applicant, must transport injured animals to a qualified veterinarian. Should any treated sea otter survive, the USACE or the applicant must contact the Service regarding the final disposition of the animal(s).

9 CONSERVATION RECOMMENDATIONS

Section 7(a)(1) of the ESA directs federal agencies to utilize their authorities to further the purposes of the ESA by carrying out conservation programs for the benefit of endangered and threatened species. Conservation recommendations are discretionary agency activities to minimize or avoid adverse effects of a proposed action on listed species or critical habitat, to help implement recovery plans, or to develop information.

1. We recommend the USACE and project applicant/permittee coordinate with the Service to implement programs and monitoring to reduce the risk of inadvertent harvest of Steller's eiders. These measures may include: 1) a commitment to continued education, outreach, and communication in rural communities – including communities near the action area – regarding conservation of Steller's eiders, monitoring for dead and injured Steller's eiders, documentation of lead shot available for sale, and continued outreach with subsistence hunters through distribution of educational materials and contact through virtual and public meetings; and 2) continued support of biological monitoring for Steller's eiders via aerial and ground surveys of their molting and wintering habitat in the Izembek Complex.
2. We recommend the USACE and project applicant/permittee coordinate with the Service to monitor sea otter abundance and use of the action area during and after road construction to assist in understanding sea otter movement and habitat use in response to project activities and effects of the action.
3. We recommend the USACE and project applicant/permittee coordinate with the Service to monitor Steller's eider abundance and habitat use in the action area and disturbance in Izembek Lagoon during and after road construction to assist in understanding eider response to project activities and effects of the action.
4. We recommend the USACE and project applicant/permittee coordinate with the Service to monitor and evaluate collision risk to Steller's eiders from vehicles after construction of the road.
5. We recommend the USACE and project applicant/permittee coordinate with the Service to complete long-term monitoring of changes in OHV/ATV use in Izembek Wilderness following construction of the road. When developing the Fish and Wildlife Protection Plan and the Marine Mammal Protection Plan, the ADOT&PF should include further mitigation measures and monitoring for deterring and managing OHV/ATV use.

We request notification of the implementation of any conservation recommendations for the Service to be kept informed of actions minimizing or avoiding adverse effects or benefitting listed species or their habitats. Notification should be submitted to the general delivery mailbox at *ak_fisheries@fws.gov*. Please include the consultation number (2026-0057356) in the subject line of the correspondence.

10 REINITIATION NOTICE

This concludes formal consultation for the King Cove to Cold Bay Road project. As provided in 50 CFR 402.16, reinitiation of consultation is required and shall be requested by the Federal agency or by the Service, where discretionary federal agency involvement or control over the action has been retained (or is authorized by law) and if: (1) the amount or extent of incidental take is exceeded; (2) new information reveals effects of the agency action that may affect listed species or critical habitat in a manner or to an extent not considered in this opinion; (3) the agency action is subsequently modified in a manner that causes an effect to the listed species or critical habitat not considered in this biological opinion or written concurrence; or (4) a new species is listed or critical habitat designated that may be affected by the action. In instances where the amount or extent of incidental take is exceeded, any operations causing such take must cease pending reinitiation.

LITERATURE CITED

Aars, J., and R.A. Ims. 2002. Intrinsic and climatic determinants of population demography: the winter dynamics of tundra voles. Ecology 83:3449–3456.

AASHTO. 2018. A Policy on Geometric Design of Highways and Streets, 7th Edition, 2018. Washington D.C.

AASHTO. 2019. Guidelines for Geometric Design of Low-Volume Roads, 2nd Edition, 2019. Washington D.C.

ADEC, [Alaska Department of Environmental Conservation]. 2020a. Alaska Department of Environmental Conservation 2020 Integrated Report Fact Sheet.

ADEC. 2020b. Cold Bay, Alaska Final Category 4b Demonstration: Petroleum Hydrocarbons, Oils, and Grease Demonstration. Waterbody Determination Final Report.

ADEC. 2025. Alaska DEC Contaminated Sites Mapper. State of Alaska Geoportal. <https://www.arcgis.com/home/item.html?id=315240bfbaf84aa0b8272ad1cef3cad3>. Accessed 26 Jun 2025.

ADEC. 2026. Contaminated Sites Search. Contaminated Stites Database.

Adell, A.D., G. McBride, S. Wuertz, P.A. Conrad, and W.A. Smith. 2016. Comparison of human and southern sea otter (Enhydra lutris nereis) health risks for infection with protozoa in nearshore waters. Water Research 104:220–230.

ADF&G. 2010. Izembek State Game Refuge Management Plan. Alaska Department of Fish and Game, Anchorage, Alaska.

ADF&G. 2024. Alaska Department of Fish and Game Anadromous Waters Catalog. Online Database. <https://www.adfg.alaska.gov/sf/SARR/AWC/index.cfm?ADFG=main.home>.

ADF&G. 2025. Division of Subsistence - CSIS Data Downloader. <https://adfg-ak-subsistence.shinyapps.io/CSIS-Data-Downloader/>. Accessed 16 Aug 2025.

ADF&G. 2026. Izembek State Game Refuge Visitor Information. <https://www.adfg.alaska.gov/index.cfm?adfg=izembek.access>. Accessed 2 Apr 2026.

ADF&G and ADOT&PF. 2025. Memorandom of Agreement between Alaska Department of Fish and Game and Alaska Department of Transportation and Public Facilities for the Design, Permitting, and Construction of Culverts for Fish Passage. Juneau, Alaska.

ADOT&PF. 2020. SF 299 Application submitted under Alaska National Interests Lands Act (ANILCA) Section 1110(b) for Access to Inholdings at King Cove, Alaska. Juneau, Alaska.

ADOT&PF. 2025. Alaska Highway Preconstruction Manual.

ADOT&PF. 2026a. Biological Assessment - King Cove to Cold Bay Road Project: Appendix B - PIH / PS&E Review Plan Set. Juneau, Alaska.

ADOT&PF. 2026b. Biological Assessment - King Cove to Cold Bay Road Project. Juneau, Alaska.

ADOT&PF. 2026c. Compensatory Mitigation Plan: King Cove to Cold Bay Road Project.

ADOT&PF. 2026d. Biological Assessment - Addendum. Juneau, Alaska.

Alaska Science Center. 2026. Harmful Algal Bloom Toxins in Alaska Seabirds. Science. Government. <https://www.usgs.gov/centers/alaska-science-center/science/harmful-algal-bloom-toxins-alaska-seabirds>.

Anderson, D., E. Fachon, K. Hubbard, K. Lefebvre, P. Lin, R. Pickart, M. Richlen, G. Sheffield, and C. Van Hemert. 2022. Harmful Algal Blooms in the Alaskan Arctic: An Emerging Threat as the Ocean Warms. Oceanography 35:130–139.

Avery-Gomm, S., T. Barychka, M. English, R.A. Ronconi, S.I. Wilhelm, J. Rail, T. Cormier, M. Beaumont, C. Bowser, T.V. Burt, S.M. Collins, S. Duffy, J.A. Giacinti, S. Gilliland, J. Giroux, C. Gjerdrum, M. Guillemette, K.E. Hargan, M. Jones, A. Kennedy, L. Kusalik, S. Lair, A. Lang, R.A. Lavoie, C. Lepage, G. McPhail, W.A. Montevecchi, G.J. Parsons, J.F. Provencher, I. Rahman, G.J. Robertson, Y. Seyer, C. Soos, C.R.E. Ward, R. Wells, and J. Wight. 2024. Wild bird mass mortalities in eastern Canada associated with the Highly Pathogenic Avian Influenza A (H5N1) virus, 2022. Coastal and Marine Ecology 15:e4980.

Ballachey, B.E., J.L. Bodkin, and A.R. DeGange. 1994. An overview of sea otter studies. Page 13 in T. R. Loughlin, editor. Marine mammals and the Exxon Valdez. Academic Press, San Diego, CA.

Barbier, E.B., S.D. Hacker, C. Kennedy, E.W. Koch, A.C. Stier, and B.R. Silliman. 2011. The value of estuarine and coastal ecosystem services. Ecological Monographs 81:169–193.

Barrett, H.E., M. Tim Tinker, G. Bentall, and B.I. McDonald. 2025. Energetic cost of human disturbance on the southern sea otter (Enhydra lutris nereis). The Journal of Wildlife Management 89:e70012.

Beatty, W.S., M. St. Martin, and R.R. Wilson. 2021. Evaluating the current condition of a threatened marine mammal population: Estimating northern sea otter (Enhydra lutris kenyoni) abundance in southwest Alaska. Marine Mammal Science 37:1245–1260.

Bélanger, L., and J. Bédard. 1989. Response of staging greater snow geese to human disturbance. The Journal of Wildlife Management 53:713–719.

Bernton, H., and N. Herz. 2025. How a risky state investment in seafood cost Alaskans millions and left a fishing town in crisis. Pro Publica20 February 2025.

von Biela, V.R., V.A. Gill, J.L. Bodkin, and J.M. Burns. 2009. Phenotypic Plasticity in Age at First Reproduction of Female Northern Sea Otters (Enhydra lutris kenyoni). Journal of Mammalogy 90:1224–1231.

BoatInfoWorld. 2017. Alaska Boat, Yacht & Ship Owners by City. <https://www.boatinfoworld.com/boat/registrations/alaska-boat-owners-cities.asp>. Accessed 16 Aug 2025.

Bodkin, J.L. 2015. Historic and contemporary status of sea otters in the North Pacific. Pages 43–61 in S. E. Larson, J. L. Bodkin, and G. R. VanBlaricom, editors. Sea Otter Conservation. Academic Press, San Diego, CA.

Bodkin, J.L., B.E. Ballachey, H.A. Coletti, G.G. Esslinger, K.A. Kloecker, S.D. Rice, J.A. Reed, and D.H. Monson. 2012. Long-term effects of the 'Exxon Valdez' oil spill: sea otter foraging in the intertidal as a pathway of exposure to lingering oil. Marine Ecology Progress Series 447:273–287.

Bodkin, J.L., B.E. Ballachey, T.A. Dean, A.K. Fukuyama, S.C. Jewett, L. McDonald, D.H. Monson, C.E. O1Clair, and G.R. VanBlaricom. 2002. Sea otter population status and the process of recovery from the 1989 "Exxon Valdez" oil spill. Marine Ecology Progress Series 241:237–253.

Bodkin, J.L., G.G. Esslinger, and D.H. Monson. 2004. Foraging depths of sea otters and implications to coastal marine communities. Marine Mammal Science 20:305–321.

Borner, L., O. Duriez, A. Besnard, A. Robert, V. Carrere, and F. Jiguet. 2017. Bird collision with power lines: estimating carcass persistence and detection associated with ground search surveys. Ecosphere 8:e01966.
Boudouresque, C.F., G. Bernard, G. Pergent, A. Shili, and M. Verlaque. 2009. Regression of Mediterranean seagrasses caused by natural processes and anthropogenic disturbances and stress: a critical review. 52:395–418.
Braund, S.R., D.C. Burnham, L. Morehead, and L. Hale. 1986. Effects of Renewable Resource Harvest Disruptions on Community Socioeconomic and Sociocultural Systems: King Cove. Social and Economic Studies Program, Technical Report, U.S. Department of Interior, Minerals Management Service, Anchorage, Alaska.
Brueggeman, J.J., G. Green, R. Grotefendt, and D. Chapman. 1988. Aerial surveys of sea otters in the northwestern Gulf of Alaska and southeastern Bering Sea. Department of the Interior.
Burdon, F.J., A.R. McIntosh, and J.S. Harding. 2013. Habitat loss drives threshold response of benthic invertebrate communities to deposited sediment in agricultural streams. Ecological Applications 23:1036–1047.
Burn, D.M., and A.M. Doroff. 2005. Decline in sea otter (Enhydra lutris) populations along the Alaska Peninsula, 1986–2001. Fishery Bulletin 103:270–279.
Bylak, A., and K. Kukuła. 2022. Impact of fine-grained sediment on mountain stream macroinvertebrate communities: Forestry activities and beaver-induced sediment management. The Science of the Total Environment 832:155079.
Byrd, G.V., and L. Daniel. 2008. Bird Species Found Oiled, December 2004 - January 2005, at Unalaska Island Following the M/V Selendang Ayu Oil Spill. Preassessment Data Report: Final Report, U.S. Fish and Wildlife Service, Alaska Maritime National Wildlife Refuge, Homer, Alaska.
CAFF. 1997. Circumpolar Eider Conservation Strategy and Action Plan. Prepared by the Circumpolar Seabird Working Group, Program for the Conservation of Arctic Flora and Fauna.
Chambers, J.S., and H.W. Magnuson. 1950. Seasonal Variations in Toxicity of Butter Clams from Selected Alaska Beaches. Special Scientific Report - Fisheries, U.S. Fish and Wildlife Service, Washington, D.C.
ChemTrack Alaska, Inc. 2025a. Phase I environmental site assessment – Izembek National Wildlife Refuge KCC Parcels AA-6675-B, Township 57, Range 88 West of Seward Meridian, Cold Bay, Alaska. Prepared for U.S. Fish and Wildlife Service, Division of Realty, Anchorage, Alaska. 115 pp.
ChemTrack Alaska, Inc. 2025b. Phase I environmental site assessment – Izembek National Wildlife Refuge Road Corridor. Prepared for U.S. Fish and Wildlife Service, Division of Realty, Anchorage, Alaska. 115 pp.
City of King Cove Resolution 94-26. 1994. King Cove, Alaska.
City of King Cove. 2025. King Cove, Alaska. City of King Cove Alaska. <cityofkingcove.com>. Accessed 25 Aug 2025.
City of Sand Point. 2014. Sand Point, Alaska - City of Sand Point. <https://www.sandpointak.com/>.
CMS FAO Co-convened Scientific Task Force on Avian Influenza in Wild Birds. 2023. Scientific Task Force on Avian Influenza and Wild Birds Statement on: H5N1 high

pathogenicity avian influenza in wild birds - Unprecedented conservation impacts and urgent needs. Food and Agriculture Organization of the United Nations.
Coelho, S.M., J.W. Rijstenbil, and M.T. Brown. 2000. Impacts of anthropogenic stresses on the early development stages of seaweeds. Journal of Aquatic Ecosystem Stress and Recovery 7:317–333.
Cold Bay Outfitters. 2017. Cold Bay Adventures Lodge: Alaska's Premier Waterfowl Hunting & Fishing Lodge. <http://coldbayoutfitters.com/izembek/>. Accessed 2 Apr 2026.
Connell, S., B. Russell, D. Turner, S. Shepherd, T. Kildea, D. Miller, L. Airoldi, and A. Cheshire. 2008. Recovering a lost baseline: missing kelp forests from a metropolitan coast. Marine Ecology Progress Series 360:63–72.
Contreras-Porcia, L., A. Meynard, C. Bulboa, P. Vargas, J. Rivas, N. Latorre-Padilla, S.A. Navarrete, F.V. Search, C. Oyarzo-Miranda, and F. Toro-Mellado. 2023. Expansion of marine pollution along the coast: Negative effects on kelps and contamination transference to benthic herbivores? Marine Environmental Research 192:106229.
Cornell Lab of Ornithology. 2025. Brant Life History, All About Birds, Cornell Lab of Ornithology. All About Birds. Cornell Lab of Ornithology. <https://www.allaboutbirds.org/guide/Brant/lifehistory>. Accessed 26 Aug 2025.
Culp, J.M., F.J. Wrona, and R.W. Davies. 1986. Response of stream benthos and drift to fine sediment deposition versus transport. Canadian Journal of Zoology 64:1345–1351.
Dagys, M., and R. Žydelis. 2002. Bird bycatch in fishing nets in Lithuanian coastal waters in wintering season 2001-2002. Acta Zoologica Lituanica 12:276–282.
Daniels, B.L., E.E. Osnas, M.L. Boldenow, R.F. Gerlach, C.A. Ahlstrom, S.M. Coburn, M.J. Brook, M. Brubaker, J.B. Fischer, D.N. Koons, A.C. Matz, M.A. Murphy, D.J. Rizzolo, L.C. Scott, D.R. Sinnett, J.M. Thompson, J.B. Lenoch, M.K. Torchetti, D.E. Stallknecht, R.L. Poulson, and A.M. Ramey. 2025. Observational, Virologic, and Serologic Data Provide Insights into an Outbreak of Highly Pathogenic Avian Influenza among Wild Birds on the Yukon-Kuskokwim Delta, Alaska, USA, in 2022. Journal of Wildlife Diseases 61:1010–1027.
Danielson, S.L., T.D. Hennon, D.H. Monson, R.M. Suryan, R.W. Campbell, S.J. Baird, K. Holderied, and T.J. Weingartner. 2022. Temperature variations in the northern Gulf of Alaska across snyoptic to century-long time scales. Deep-Sea Research Part II 203:105155.
Dau, C.P. 1987. Birds in nearshore waters of the Yukon-Kuskokwim Delta, Alaska. Murrelet 68:12–23.
Dau, C.P., P.L. Flint, and M.R. Petersen. 2000. Distribution of Recoveries of Steller's Eiders Banded on the Lower Alaska Peninsula, Alaska. Journal of Field Ornithology 71:541–548.
Davis, R.W., F.W. Awbrey, and T.M. Williams. 1987. Using sounds to control the movements of sea otters. Miami, Florida, USA.
Davis, R.W., T.M. Williams, and F.W. Awbrey. 1988. Sea otter oil spill avoidance study. U.S. Department of Interior, Minerals Management Service, San Diego, California.
Day, R.H., J.R. Rose, A.K. Prichard, R.J. Blaha, and B.A. Cooper. 2004. Environmental effects on the fall migration of eiders at Barrow, Alaska. Marine Ornithology 32:13–24.
Day, R.H., A.K. Prichard, J.R. Rose, and A.A. Stickney. 2005. Migration and Collision Avoidance of Eiders and Other Birds at Northstar Island, Alaska, 2001-2004.

Unpublished Report, ABR, Inc.- Environmental Research and Services, Fairbanks, Alaska.
Dayton, P.K., V. Currie, T. Gerrodette, B.D. Keller, R. Rosenthal, and D.V. Tresca. 1984. Patch Dynamics and Stability of Some California Kelp Communities. Ecological Monographs 54:254–289.
Dean, T.A., J.L. Bodkin, A.K. Fukuyama, S.C. Jewett, D.H. Monson, C.E. O1Clair, and G.R. VanBlaricom. 2002. Food limitation and the recovery of sea otters following the “Exxon Valdez” oil spill. Marine Ecology Progress Series 241:255–270.
Dietrich, K.S., K.J. Kuletz, and M.A. Moon. 2025. Marine Bird Bycatch in Alaska Salmon Gillnet Fisheries. Fisheries Management and Ecology 22.
Doeg, T., and G. Milledge. 1991. Effect of experimentally increasing concentration of suspended sediment on macroinvertebrate drift. Marine and Freshwater Research 42:519.
DOI/USFWS. 2013a. Izembek National Wildlife Refuge Land Exchange/Road Corridor Final Environmental Impact Statement. Environmental Impact Statement, U.S. Department of Interior, U.S. Fish and Wildlife Service.
DOI/USFWS. 2013b. Izembek National Wildlife Refuge Land Exchange/Road Corridor Final Environmental Impact Statement Record of Decision. Record of Decision, United States Department of the Interior, U.S. Fish and Wildlife Service.
Dorn, M.W., C.J. Cunningham, M. Dalton, B.S. Fadely, B.L. Gerke, A.B. Hollowed, K.K. Holsman, J.H.H. Moss, O.A. Ormseth, W.A. Palsson, P.H. Ressler, L.A. Rogers, M.F. Sigler, P.J. Stabeno, and M. Szymkowiak. 2017. A climate science: regional action plan for the Gulf of Alaska. NOAA technical memorandum, NOAA Alaska Fisheries Science Center.
Doroff, A.M., and M. Roy. 1999. Sea otter surveys of Izembek Lagoon, Alaska: a pilot study. U.S. Fish and Wildlife Service, Marine Mammals Management, Anchorage, Alaska.
Douglas, D.C., M.D. Fleming, V.P. Patil, and D.H. Ward. 2025. Mapping Eelgrass (Zostera marina) Cover and Biomass at Izembek Lagoon, Alaska, Using In-situ Field Data and Sentinel-2 Satellite Imagery. U.S. Geological Survey Open-File Report 2025-1007, 30 p.
Duarte, C.M. 1995. Submerged aquatic vegetation in relation to different nutrient regimes. Ophelia.
Dudley, J.P., E.P. Hoberg, E.J. Jenkins, and A.J. Parkinson. 2015. Climate change in the North American Arctic: a one health perspective. EcoHealth 12:713–725.
Duffy, T., G. Kilpatrick, K. Krotki, T. Lewis, J. McMichael, D. Palmer, J. Ridenhour, A. Ryder-Burge, I. Thomas, S. Willis, E. Mahoney, and T. Herbowicz. 2020. National Recreational Boating Safety Exposure Survey Final Report. RTI International DHS, U.S. Coast Guard, and Michigan State University.
Dunham, K., and J.B. Grand. 2016. Viability of the Alaskan breeding population of Steller’s eiders: U.S. Geological Survey Open-File Report 2016–1084, 8 pp.
Dunham, K., and J.B. Grand. 2017. Evaluating models of population process in a threatened population of Steller’s eiders: a retrospective approach. Ecosphere 8:e01720.
Environmental Science and Engineering Inc. 1989. Physical oceanography. Pages 40–98 in. Outer Continental Shelf Environmental Assessment Program. Volume 60. U.S. Department of Interior, National Oceanic and Atmospheric Association, Anchorage, Alaska.

Erbe, C., S.A. Marley, R.P. Schoeman, J.N. Smith, L.E. Trigg, and C.B. Embling. 2019. The Effects of Ship Noise on Marine Mammals—A Review. Frontiers in Marine Science 6:606.

Esslinger, G. 1999. Aerial survey of sea otters stranded by Bristol Bay ice near Port Heiden, Alaska in March 1999. U.S. Geological Survey.

Esslinger, G.G., J.L. Bodkin, A.R. Breton, J.M. Burns, and D.H. Monson. 2014. Temporal patterns in the foraging behavior of sea otters in Alaska. The Journal of Wildlife Management 78:689–700.

Estes, J. a., D. f. Doak, A. m. Springer, and T. m. Williams. 2009. Causes and consequences of marine mammal population declines in southwest Alaska: a food-web perspective. Philosophical Transactions of the Royal Society B: Biological Sciences 364:1647–1658.

Estes, J.A. 1980. Enhydra lutris. Mammalian Species 15:1–8.

Fall, J.A., R. Mason, T. Haynes, V. Vanek, L. Brown, G. Jennings, C. Mishler, and C. Utermohle. 1993. Noncommercial Harvests and Uses of Wild Resources in King Cove, Alaska, 1992. Technical Paper, Alaska Department of Fish and Game, Juneau, Alaska.

Feder, H.M., and S.C. Jewett. 1987. The subtidal benthos. D. W. Hood and S. T. Zimmerman, editors. The Gulf of Alaska physical environment and biological resources. Bureau of Land Management, National Oceanic and Atmospheric Association, Minerals Management Service Office, Anchorage, Alaska.

Filbee-Dexter, K., and T. Wernberg. 2018. Rise of Turfs: A New Battlefront for Globally Declining Kelp Forests.

Flint, P.L. 2015. Population dynamics of sea ducks. Ecology and conservation of North American sea ducks. CRC Press, New York, New York, USA 63–96.

Flint, P.L., and M.P. Herzog. 1999. Breeding of Steller's Eiders, Polysticta stelleri, on the Yukon-Kuskokwim Delta, Alaska. Canadian Field-Naturalist 113:306–308.

Flint, P.L., and J.L. Schamber. 2010. Long-term persistence of spent lead shot in tundra wetlands. The Journal of wildlife management 74:148–151.

Flint, P.L., J.L. Schamber, K.A. Trust, A.K. Miles, J.D. Henderson, and B.W. Wilson. 2012. Chronic hydrocarbon exposure of harlequin ducks in areas affected by the Selendang Ayu oil spill at Unalaska Island, Alaska. Environmental Toxicology and Chemistry 31:2828–2831.

Flint, P.L., M.R. Petersen, C.P. Dau, J.E. Hines, and J.D. Nichols. 2000. Annual Survival and Site Fidelity of Steller's Eiders Molting along the Alaska Peninsula. The Journal of Wildlife Management 64:261–268.

Franson, J.C. 2015. Contaminants in sea ducks: Metals, trace elements, petroleum, organic pollutants, and radiation. Pages 169–240 in J.-P. L. Savard, D. V. Derksen, and D. Esler, editors. Ecology and Conservation of North American Sea Ducks. Studies in Avian Biology 46.

Franson, J.C., M.R. Petersen, C.U. Meteyer, and M.R. Smith. 1995. Lead Poisoning of Spectacled Eiders (Somateria fischeri) and of a Common Eider (Somateria mollissima) in Alaska. Journal of Wildlife Diseases 31:268–271.

Fredrickson, L.H. 2001. Steller's Eider (Polysticta stelleri). A. F. Poole and F. B. Gill, editors. Birds of North America. Version 2.0. Cornell Lab of Ornithology, Ithaca, NY, USA.

Frost, C.J., T.E. Hollmen, and J.H. Reynolds. 2013. Trends in Annual Survival of Steller's Eiders Molting at Izembek Lagoon on the Alaska Peninsula, 1993 – 2006. Arctic 66:173–178.

Funk, F. 2003. Overview of State-Managed Marine Fisheries in Southwestern Alaska with reference to the southwest stock of sea otters. Alaska Department of Fish and Game, Division of Commercial Fisheries, Juneau, Alaska.

Garshelis, D.L., and J.A. Garshelis. 1984. Movements and Management of Sea Otters in Alaska. The Journal of Wildlife Management 48:665–678.

George, T.L., D. Otis, and P. Doherty. 2015. Review of Subsistence Harvest Survey. Colorado State University, Department of Fish, Wildlife, and Conservation Biology, Fort Collins, Colorado.

Gibble, C.M., R.M. Kudela, S. Knowles, B. Bodenstein, and K.A. Lefebvre. 2021. Domoic acid and saxitoxin in seabirds in the United States between 2007 and 2018. Harmful Algae 103:101981.

Gilg, O., B. Sittler, and I. Hanski. 2009. Climate change and cyclic predator-prey population dynamics in the high Arctic. Global Change Biology 15:2634–2652.

Gill, J.A. 2007. Approaches to measuring the effects of human disturbance on birds. Ibis 149:9–14.

Gjessing, E., E. Lygren, L. Berglind, T. Gulbrandsen, and R. Skanne. 1984. Effect of highway runoff on lake water quality. Science of the Total Environment 33:245–257.

Goldfarb, B. 2023. Crossings: How Road Ecology is Shaping the Future of Our Planet. W.W. Norton & Company.

Gorgula, S.K., and S.D. Connell. 2004. Expansive covers of turf-forming algae on human-dominated coast: the relative effects of increasing nutrient and sediment loads. Marine Biology 145:613–619.

Goudie, R.I., and C.D. Ankney. 1986. Body Size, Activity Budgets, and Diets of Sea Ducks Wintering in Newfoundland. Ecology 67:1475–1482.

Graziosi, G., C. Lupini, E. Catelli, and S. Carnaccini. 2024. Highly Pathogenic Avian Influenza (HPAI) H5 Clade 2.3.4.4b Virus Infection in Birds and Mammals. Animals 14:1372.

Grebmeier, J.M., L.W. Cooper, H.M. Feder, and B.I. Sirenko. 2006. Ecosystem dynamics of the Pacific-influenced northern Bering and Chukchi seas in the Amerasian Arctic. Progress in Oceanography 71:331–361.

Greenly, T. 2023. Military responds to munition found in Izembek National Wildlife Refuge. KUCB8 November 2023; section Regional.

Hauxwell, J., J. Cebrian, and I. Valiela. 2003. Eelgrass Zostera marina loss in temperate estuaries: relationship to land-derived nitrogen loads and effect of light limitation imposed by algae. Marine Ecology Progress Series 247:59–73.

Himes-Cornell, A., K. Hoelting, C. Maguire, L. Munger-Little, J. Lee, J. Fisk, R. Felthoven, C. Geller, and P. Little. 2013. Community Profiles for North Pacific Fisheries - Alaska. Volume 6, Technical Memorandum, U.S. Department of Commerce, National Oceanic and Atmospheric Administration, National Marine Fisheries Service.

Hodges, J.I., and W.D. Eldridge. 2001. Aerial surveys of eiders and other waterbirds on the eastern Arctic coast of Russia. Wildfowl 52:127–142.

Hoffman, D.J. 1990. Embyrotoxicity and teratogenicity of environmental contaminants to bird eggs. Archives of Environmental Contamination and Toxicology 115:39–89.

Hogrefe, K.R., D.H. Ward, T.F. Donnelly, and N. Dau. 2014. Establishing a Baseline for Regional Scale Monitoring of Eelgrass (Zostera marina) Habitat on the Lower Alaska Peninsula. Remote Sensing 6:12447–12477.

Hohman, W.L., C.D. Ankney, and D.H. Gordon. 1992. Ecology and management of postbreeding waterfowl. Page Chapter 5, 128-189 in B. D. J. Batt, A. D. Afton, M. G. Anderson, C. D. Ankney, D. H. Johnson, J. A. Kadlec, and G. L. Krapu, editors. Ecology and management of breeding waterfowl. University of Minnesota Press, Minneapolis, Minnesota.

Hollmén, T.E., P.L. Flint, S.E.G. Ulman, and A.M. Maliguine. 2022. Are changes in suitability of essential lagoon habitats driving declines of Steller's eiders in the eastern Aleutians? Final Report, North Pacific Research Board, Fairbanks, Alaska.

Howell, M.D., J.B. Grand, and P.L. Flint. 2003. Body molt of male long-tailed ducks in the near-shore waters of the North Slope, Alaska. Wilson Bulletin 115:170–175.

Huntington, H.P. 2009. Appendix 1: Documentation of Subsistence Harvest of Spectacled Eiders and Steller's Eiders in Western and Northern Alaska: A Literature Review.

Ibisch, P.L., M.T. Hoffmann, S. Kreft, G. Pe'er, V. Kati, L. Biber-Freudenberger, D.A. DellaSala, M.M. Vale, P.R. Hobson, and N. Selva. 2016. A global map of roadless areas and their conservation status. Science 354:1423–1427.

IPCC. 2019. Special report on the ocean and cryosphere in a changing climate. Cambridge University Press, Cambridge, UK and New York, USA.

Jessup, D.A., M. Chechowitz, J. Ames, M. Harris, K. Worcester, D. Paradies, and J.A. Mazet. 2000. The Decline of the Southern Sea Otter (Enhydra lutris nereis): Is It an Indicator of Contaminant and Pathogen Pollution, Anthropogenic Interference, and Declining Marine Ecosystem Health?

Jessup, D.A., C.K. Johnson, J. Estes, D. Carlson-Bremer, W.M. Jarman, S. Reese, E. Dodd, M.T. Tinker, and M.H. Ziccardi. 2010. Persistent organic pollutants in the blood of free-ranging sea otters (Enhydra lutris ssp.) in Alaska and California. Journal of Wildlife Diseases 46:1214–1233.

Jewett, S.C., T.A. Dean, R.O. Smith, and A. Blanchard. 1999. "Exxon Valdez" oil spill: impacts and recovery in the soft-bottom benthic community in and adjacent to eelgrass beds. Marine Ecology Progress Series 185:59–83.

Johnson, C.B., and D.L. Garshelis. 1995. Sea Otter Abundance, Distribution, and Pup Production in Prince William Sound Following the Exxon Valdez Oil Spill.

Jones, J.I., J.F. Murphy, A.L. Collins, D.A. Sear, P.S. Naden, and P.D. Armitage. 2012. The Impact of Fine Sediment on Macro-Invertebrates. River Research and Applications 28:1055–1071.

Jones, R.D.J. 1965. Returns from Steller's Eiders Banded in Izembek Bay, Alaska. Wildfowl 16:83–85.

Kapsar, K., B.K. Sullender, and K.J. Kuletz. 2026. A multiscale seasonal examination of the risk of harm to seabirds from vessels based on co-occurrence in Alaskan waters. Conservation Biology e70115.

Kausrud, K.L., A. Mysterud, H. Steen, J.O. Vik, E. Ostbye, B. Caselles, E. Framstad, A.M. Eikeset, I. Msyerud, T. Solhoy, and N.C. Stenseth. 2008. Linking climate change to lemming cycles. Nature 456:93–97.

Kenyon, K.W. 1969. The Sea Otter in the Eastern Pacific Ocean. North American Fauna 68, U.S. Department of the Interior, Washington, D.C.

Kenyon, K.W., and J.G. King. 1965. Aerial survey of sea otters, other marine mammals and birds, Alaska Peninsula and Aleutian Islands, 19 April to 9 May, 1965. Unpublished Report, U.S. Fish and Wildlife Service.

Kertell, K. 1991. Disappearance of the Steller's eider from the Yukon-Kuskokwim Delta, Alaska. Arctic 44:177–187.
Keser, M., J.T. Swenarton, J.M. Vozarik, and J.F. Foertch. 2003. Decline in eelgrass (Zostera marina L.) in Long Island Sound near Millstone Point, Connecticut (USA) unrelated to thermal input. Journal of Sea Research 49:11–26.
Keyse, M., G. Spalinger, and A. Brewster. 2024. 2023 South Alaska Peninsula Salmon Annual Management Report and 2022 Subsistence Fisheries in the Alaska Peninsula, Aleutian Islands, and Atka-Amlia Islands Management Area. Alaska Department of Fish and Game, Divisions of Sport Fish and Commercial Fisheries, Anchorage, Alaska.
King, J.G., and C.P. Dau. 1981a. Waterfowl and Their Habits in the Eastern Bering Sea. Pages 739–753 in. The Eastern Bering Sea Shelf: Oceanography and Resources. Volume 2. United States Department of Commerce, National Oceanic and Atmospheric Administration, Office of Marine Pollution Assessment, Seattle, Washington.
Knapton, R.W., S.A. Petrie, and G. Herring. 2000. Human Disturbance of Diving Ducks on Long Point Bay, Lake Erie. Wildlife Society Bulletin 28:923–930.
Korschgen, C.E., and R.B. Dahlgren. 1992. Human Disturbances of Waterfowl: Causes, Effects, and Management (13.2.15). Waterfowl Management Handbook. U.S. Fish and Wildlife Service, Lincoln, Nebraska.
Kreuder, C., M.A. Miller, D.A. Jessup, L.J. Lowenstine, M.D. Harris, J.A. Ames, T.E. Carpenter, P.A. Conrad, and J.A. Mazet. 2003. Patterns of Mortality in Southern Sea Otters (Enhydra lutris nereis) from 1998-2001. Journal of Wildlife Diseases 39.
Labunski, E., S. Fitzgerald, and A. Kingham. 2022. A Review of Seabird Vessel Strikes in Alaska Groundfish Fisheries 2010-2021. Poster Presentation, Virtual.
Langdon, S.J. 1982. Alaska Peninsula Socioeconomic and Sociocultural Systems Analysis. Alaska OCS Socioeconomic Studies Program, Technical Report, U.S. Bureau of Land Management, Alaska Outer Continental Shelf Office, Springfield, Virginia.
Langer, M., T. Schneider von Deimling, S. Westermann, R. Rolph, R. Rutte, S. Antonova, V. Rachold, M. Schultz, A. Oehme, and G. Grosse. 2023. Thawing permafrost poses environmental threats to thousands of sites with legacy industrial contamination. nature communications 14.
Laubhan, M.K., and K.A. Metzner. 1999. Distribution and Diurnal Behavior of Steller's Eiders Wintering on the Alaska Peninsula. The Condor 101:694–698.
Laverty, L. 2020. Analysis: Should There Be a Road Through Izembek National Wildlife Refuge? Living Bird.
Leach, A.G., D.H. Ward, J.S. Sedinger, M.S. Lindberg, W.S. Boyd, J.W. Hupp, and R.J. Ritchie. 2017. Declining survival of black brant from subarctic and arctic breeding areas. The Journal of Wildlife Management 81:1210–1218.
Leach, A.G., D.H. Ward, J.S. Sedinger, T.V. Riecke, J.W. Hupp, and R.J. Ritchie. 2019. Spatial Distribution of Band Recoveries of Black Brant. The Journal of Wildlife Management 83:304–311.
Lefebvre, K.A., L. Quakenbush, E. Frame, K.B. Huntington, G. Sheffield, R. Stimmelmayr, A. Bryan, P. Kendrick, H. Ziel, T. Goldstein, J.A. Snyder, T. Gelatt, F. Gulland, B. Dickerson, and V. Gill. 2016. Prevalence of algal toxins in Alaskan marine mammals foraging in a changing arctic and subarctic environment. Harmful Algae 55:13–24.

Limpinsel, D., S. McDermott, C. Felkley, E. Ammann, S. Coxe, G.A. Harrington, S. Kelly, J.L. Pirtle, L. Shaw, and M. Zaleski. 2023. Impacts to Essential Fish Habitat from Non-Fishing Activities in Alaska: EFH 5-year review from 2018-2023.

Lipscomb, T.P., R.K. Harris, A.H. Rebar, B.E. Ballachey, and R.J. Haebler. 1994. Pathology of sea otters. Pages 265–280 in T. R. Loughlin, editor. Marine mammals and the Exxon Valdez. Academic Press, San Diego, CA.

Liu, K., H. Lin, X. He, Y. Huang, Z. Li, J. Lin, J. Mou, S. Zhang, L. Lin, J. Wang, and J. Sun. 2019. Functional trait composition and diversity patterns of marine macrobenthos across the Arctic Bering Sea. Ecological Indicators 102:673–685.

Longstaff, B.J., and W.C. Dennison. 1999. Seagrass survival during pulsed turbidity events: the effects of light deprivation on the seagrasses Halodule pinifolia and Halophila ovalis. Aquatic Botany 65:105–121.

Lotze, H.K., H.S. Lenihan, B.J. Bourque, R.H. Bradbury, R.G. Cooke, M.C. Kay, S.M. Kidwell, M.X. Kirby, C.H. Peterson, and J.B.C. Jackson. 2006. Depletion, Degradation, and Recovery Potential of Estuaries and Coastal Seas. Science 312:1806–1809.

Lovvorn, J.R., M.F. Raisbeck, L.W. Cooper, G.A. Cutter, M.W. Miller, M.L. Brooks, J.M. Grebmeier, A.C. Matz, and C.M. Schaefer. 2013. Wintering eiders acquire exceptional Se and Cd burdens in the Bering Sea: Physiological and oceanographic factors. Marine Ecology Progress Series 489:254–261.

Maliguine, A.M. 2024. Changes in benthic prey availability and quality suggest less favorable foraging conditions for threatened Steller’s eiders (Polysticta stelleri) molting at Izembek Lagoon, Alaska. Master’s Thesis, University of Alaska Fairbanks, Fairbanks, Alaska.

Maliguine, A.M., T.E. Hollmen, C.L. Amundson, and B.H. Konar. 2025. Changes in benthic prey availability and quality suggest less favorable foraging conditions for Threatened Steller’s eiders (Polysticta stelleri) molting at Izembek Lagoon, Alaska. Polar Biology 48.

Manville, A.M. 2005. Bird Strikes and Electrocutions at Power Lines, Communication Towers, and Wind Turbines: State of the Art and State of the Science – Next Steps Toward Mitigation. General Technical Report, United States Forest Service.

Marine Mammal Commission. 2024. High Path Avian Influenza (HPAI) in Marine Mammals. Fact Sheet.

Martin, P.D., D.C. Douglas, T. Obritschkewitsch, and S. Torrence. 2015. Distribution and movements of Alaska-breeding Steller’s Eiders in the nonbreeding period. The Condor 117:341–353.

McConnaughey, T. 1978. Ecosystems naturally labeled with Carbon-13: application to the study of consumer foodwebs. University of Alaska Fairbanks, Fairbanks, Alaska.

McKinney, F. 1965. The Spring Behavior of Wild Steller Eiders. The Condor 67:273–290.

McRoy, C.P. 1966. The standing stock and ecology of eelgrass (Zostera marina) in Izembek Lagoon, Alaska. M.Sc., University of Washington, Seattle, Washington.

McShane, L.J., J.A. Estes, M.L. Riedman, and M.M. Staedler. 1995. Repertoire, Structure, and Individual Variation of Vocalizations in the Sea Otter. Journal of Mammalogy 76:414–427.

Merkel, F.R., and K.L. Johansen. 2011. Light-induced bird strikes on vessels in Southwest Greenland. Marine Pollution Bulletin 62:2330–2336.

Merkel, F.R., A. Mosbech, and F. Riget. 2009. Common Eider Somateria mollissima feeding activity and the influence of human disturbances. Ardea 97:99–107.

Metzner, K.A. 1993. Ecological strategies of wintering Steller's eiders on Izembek Lagoon and Cold Bay, Alaska. University of Missouri-Columbia.
Miles, A.K., P.L. Flint, K.A. Trust, M.A. Ricca, S.E. Spring, D.E. Arrieta, T. Hollmén, and B.W. Wilson. 2007. Polycyclic aromatic hydrocarbon exposure in Steller's eiders (Polysticta stelleri) and Harlequin ducks (Histronicus histronicus) in the eastern Aleutian Islands, Alaska, USA. Environmental Toxicology and Chemistry 26:2694–2703.
Miller, M.W. 2023. Wetland habitat use, protein sources for reproduction, and nest habitat selection by sea ducks facing rapid change in the Alaskan Arctic. PhD Dissertation, Southern Illinois University, Carbondale, Illinois.
Miller, M.W., J.R. Lovvorn, A.C. Matz, R.J. Taylor, and M.L. Brooks. 2019. Interspecific patterns of trace elements in sea ducks: Can surrogate species be used in contaminants monitoring? Ecological Indicators 98:830–839.
Miller, M.W., J.R. Lovvorn, A.C. Matz, R.J. Taylor, C.J. Latty, and D.E. Safine. 2016. Wintering eiders acquire exceptional Se and Cd burdens in the Bering Sea: Physiological and oceanographic factors. Archives of Environmental Contaminants and Toxicology 71:297–312.
Monson, D.H., J.A. Estes, J.L. Bodkin, and D.B. Siniff. 2000. Life history plasticity and population regulation in sea otters. Oikos 90:457–468.
Moore, K.A., R.L. Wetzel, and R.J. Orth. 1997. Seasonal pulses of turbidity and their relations to eelgrass (Zostera marina L.) survival in an estuary. Journal of Experimental Marine Biology and Ecology 215:115–134.
Moriarty, M.E., M.T. Tinker, M.A. Miller, J.A. Tomoleoni, M.M. Staedler, J.A. Fujii, F.I. Batac, E.M. Dodd, R.M. Kudela, V. Zubkousky-White, and C.K. Johnson. 2021. Exposure to domoic acid is an ecological driver of cardiac disease in southern sea otters. Harmful Algae 101:101973.
Moy, F.E., and H. Christie. 2012. Large-scale shift from sugar kelp (Saccharina latissima) to ephemeral algae along the south and west coast of Norway. Marine Biology Research.
Murphy, G.E.P., J.C. Dunic, E.M. Adamczyk, S.J. Bittick, I.M. Côté, J. Cristiani, E.A. Geissinger, R.S. Gregory, H.K. Lotze, M.I. O'Connor, C.A.S. Araújo, E.M. Rubidge, N.D. Templeman, and M.C. Wong. 2021. From coast to coast to coast: ecology and management of seagrass ecosystems across Canada. FACETS.
Murphy, M., S. Johnson, and D. Csepp. 2000. A comparison of fish assemblages in eelgrass and adjacent subtidal habitats near Craig, Alaska. Alaska Fishery Research 7:11–21.
Naves, L.C. 2010. Alaska migratory bird subsistence harvest estimates, 2004–2007, Alaska Migratory Bird Co-Management Council.
Naves, L., and J.L. Schamber. 2024. Harvest of waterfowl and sandhill Crane in rural Alaska-. PLoS ONE 19:e0307135.
Nicholson, T.E., K.A. Mayer, M.M. Staedler, J.A. Fujii, M.J. Murray, A.B. Johnson, M.T. Tinker, and K.S. Van Houtan. 2018. Gaps in kelp cover may threaten the recovery of California sea otters. Ecography 41:1751–1762.
NMFS. 1991. 1990 Salmon Gillnet Fisheries Observer Programs in Prince William Sound and South Unimak Alaska | NOAA Fisheries. NOAA. <https://www.fisheries.noaa.gov/resource/document/1990-salmon-gillnet-fisheries-observer-programs-prince-william-sound-and-south>. Accessed 22 Aug 2025.

NMFS. 2020. IB 20-32: NMFS Reports a Vessel-strike Mortality of an Alaska-breeding Population Steller's eider in the BSAI. Bulletin, National Oceanic and Atmospheric Administration Fisheries, Alaska Regional Office, Anchorage, Alaska.

NOAA, [National Oceanic and Atmospheric Administration]. 2025. Alaska ShoreZone Mapping website. ShoreZone. Web-posted database in ArcGiS. <https://alaskafisheries.noaa.gov/mapping/sz/>. Accessed 23 Jul 2025.

NOAA, USFWS, Alaska Department of Law, Alaska Department of Natural Resources, Alaska Department of Environmental Conservation, and Alaska Department of Fish and Game. 2016. Natural Resource Damage Assessment Plan for the M/V Selendang Ayu Oil Spill. Final Report.

Øien, I.J., and T. Aarvak. 2007. The Steller's Eider – globally threatened and forgotten responsibility species. Vår fuglefauna 30:160–166.

Omelak, J. 2009. Draft: Subsistence uses of yellow-billed loons on St. Lawrence Island. Prepared For U.S. Fish and Wildlife Service Region 7, Kawerak Natural Resources, Subsistence Program, Nome, Alaska.

Orth, R.J., T.J.B. Carruthers, W.C. Dennison, C.M. Duarte, J.W. Fourqurean, K.L. Heck, A.R. Hughes, G.A. Kendrick, W.J. Kenworthy, S. Olyarnik, F.T. Short, M. Waycott, and S.L. Williams. 2006. A Global Crisis for Seagrass Ecosystems.

Ouellet, J.-F., C. Vanpé, and M. Guillemette. 2013. The Body Size-Dependent Diet Composition of North American Sea Ducks in Winter. PLOS ONE 8:e65667.

Overland, J., S. Rodionov, S. Minobe, and N. Bond. 2008. North Pacific regime shift: Definitions, issues, and recent transitions. Progress in Oceanography 77:92–102.

Pacific Rim Reporting. 2024. Public Meeting - ANICLA Section 10 Subsistence Hearing - King Cove, Alaska. Anchorage, Alaska.

Pearce, J.M., S.L. Talbot, M.R. Petersen, and J.R. Rearick. 2005. Limited genetic differentiation among breeding, molting, and wintering groups of the threatened Steller's Eider: the role of historic and contemporary factors. Conservation Genetics 6:743–757.

Petersen, M.R. 1980. Observations of wing-feather moult and summer feeding ecology of Steller's Eeiders at Nelson Lagoon, Alaska. Wildfowl 31:99–106.

Petersen, M.R. 1981. Populations, Feeding Ecology and Molt of Steller's Eiders. The Condor 83:256–262.

Petersen, M.R., J.B. Grand, and C.P. Dau. 2000. Spectacled Eider (Somateria fischeri). The Birds of North America. Cornell Lab of Ornithology, Ithaca, NY, USA.

Petersen, M.R., and M.J. Sigman. 1977. Field studies at Cape Pierce, Alaska 1976. Environmental assessment of the Alaskan continental shelf, Annual reports of principal investigators 4:633–693.

Peterson, C.H., S.D. Rice, J.W. Short, D. Esler, J.L. Bodkin, B.E. Ballachey, and D.B. Irons. 2003. Long-term ecosystem response to the Exxon Valdez oil spill. Science 302:2082–2086.

Petrich, C., A. Tivy, and D. Ward. 2014. Reconstruction of historic sea ice conditions in a sub-Arctic lagoon. Cold Regions Science and Technology 98:5562.

Phillips, R.C. 1984. Ecology of eelgrass meadows in the Pacific Northwest: a community profile. Federal Government Series Technical Report, USGS Publications Warehouse, United States.

Phillips, R.C., C. McMillan, and K.W. Bridges. 1983. Phenology of eelgrass, Zostera marina L., along latitudinal gradients in North America. Aquatic Botany 15:145–156.

Picard, M.M.M., L.E. Johnson, and I.M. Côté. 2022. Effects of sediment on spore performance as a potential constraint on kelp distribution. Marine Pollution Bulletin 185:114336.
Pihl, L., S. Baden, N. Kautsky, P. Rönnbäck, T. Söderqvist, M. Troell, and H. Wennhage. 2006. Shift in fish assemblage structure due to loss of seagrass Zostera marina habitats in Sweden. Estuarine, Coastal and Shelf Science 67.
Povoroznyuk, O., W.F. Vincent, P. Schweitzer, R. Laptander, M. Bennett, F. Calmels, D. Sergeev, C. Arp, B.C. Forbes, and P. Roy-Léveillée. 2022. Arctic roads and railways: social and environmental consequences of transport infrastructure in the circumpolar North. Arctic Science 9:297–330.
van Proosdij, D., T. Milligan, G. Bugden, and K. Butler. 2009. A Tale of Two Macro Tidal Estuaries: Differential Morphodynamic Response of the Intertidal Zone to Causeway Construction. Journal of Coastal Research 772–776.
Quakenbush, L., R. Suydam, T. Obritschkewitsch, and M. Deering. 2004. Breeding biology of Steller's eiders (Polysticta stelleri) near Barrow, Alaska, 1991-99. Arctic 166–182.
Quakenbush, L.T., R.H. Day, B.A. Anderson, F.A. Pitelka, and B.J. Mccaffery. 2002. Historical and present breeding season distribution of Steller's eiders in Alaska. Western Birds 33:2.
Rabie, P., M. Welsch, N. Stone, and C. Derby. 2024. Novel approach to estimating avian mortality from vehicle–bird collisions on U.S. roads. Journal of Field Ornithology 95:art1.
Ramus, J. 1992. Productivity of Seaweeds. Pages 239–255 in P. G. Falkowski, A. D. Woodhead, and K. Vivirito, editors. Primary Productivity and Biogeochemical Cycles in the Sea. Springer US, Boston, MA.
Rechsteiner, E.U., S.B. Wickham, and J.C. Watson. 2018. Predator effects link ecological communities: kelp created by sea otters provides an unexpected subsidy to bald eagles. Ecosphere 9.
Reed, B.J., and K.A. Hovel. 2006. Seagrass habitat disturbance: how loss and fragmentation of eelgrass Zostera marina influences epifaunal abundance and diversity. Marine Ecology Progress Series 326:133–143.
Reed, J.A., and P.L. Flint. 2007. Movements and foraging effort of Steller's eiders and harlequin ducks wintering near Dutch Harbor, Alaska. Journal of Field Ornithology 78:124–132.
Reed, J.R., J.L. Sincock, and J.P. Hailman. 1985. Light Attraction in Endangered Procellariiform Birds: Reduction by Shielding Upward Radiation. The Auk 102:377–383.
Rice, W.A., and E.V. Hogan. 1995. Overview of environmental and hydrogeologic conditions at Cold Bay, Alaska. US Geological Survey; US Geological Survey, Open-File Section [distributor].
Riedman, M.L., and J.A. Estes. 1990. The sea otter (Enhydra lutris): behavior, ecology, and natural history. ISSN 0895-1926, Biological Report, USFWS.
Ronconi, R.A., K.A. Allard, and P.D. Taylor. 2015. Bird interactions with offshore oil and gas platforms: Review of impacts and monitoring techniques. Journal of Environmental Management 147:34–45.
Rosenberg, D.H., M.J. Petrula, J.L. Schamber, D. Zwiefelhofer, T.E. Hollmén, and D.D. Hill. 2014. Seasonal Movements and Distribution of Steller's Eiders ("Polysticta stelleri") Wintering at Kodiak Island, Alaska. Arctic 67:347–359.
Rothe, T.C., P.I. Padding, L.C. Naves, and G.J. Robertson. 2015. Harvest of sea ducks in North America: A contemporary summary. Pages 417–476 in J.-P. L. Savard, D. V. Derksen, D.

Esler, and Eadie, editors. Ecology and conservation of North American sea ducks. Studies in Avian Biology 46, CRC Press, Boca Raton, Florida.
Safine, D., M.S. Lindberg, K. Martin, S.L. Talbot, T. Swem, J.M. Pearce, N. Stellrecht, K. Sage, A.E. Riddle, K. Fales, and T.E. Hollmen. 2020. Use of genetic mark-recapture to estimate breeding site fidelity and philopatry in a threatened sea duck population, Alaska-breeding Steller's eiders. Endangered Species Research 41:349–360.
Savard, J.-P.L., and M.R. Petersen. 2015. Remigial molt of sea ducks. Pages 305–336 in D. V. Derksen, D. Esler, and J. M. Eadie, editors. Ecology and conservation of North American sea ducks. CRC Press.
Schiel, D.R., J.R. Steinbeck, and M.S. Foster. 2004. Ten Years of Induced Ocean Warming Causes Comprehensive Changes in Marine Benthic Communities. Ecology 85:1833–1839.
Schindler, D.W., and J.P. Smol. 2006. Cumulative effects of climate warming and other human activities on freshwaters of Arctic and Subarctic North America. AMBIO: A Journal of the Human Environment 35:160–168.
Schneider, K. 1976. Distribution and abundance of sea otters in southwestern Bristol Bay. Unpublished Report, Alaska Department of Fish and Game.
Schneider, K., and B. Ballachey. 2008. Alaska Wildlife Notebook Series; Sea otter. Alaska Department of Fish and Game.
Schneider, K.B., and J.B. Faro. 1975. Effects of Sea Ice on Sea Otters (Enhydra lutris). Journal of Mammalogy 56:91–101.
Scholin, C.A., F. Gulland, G.J. Doucette, S. Benson, M. Busman, F.P. Chavez, J. Cordaro, R. DeLong, A. De Vogelaere, J. Harvey, M. Haulena, K. Lefebvre, T. Lipscomb, S. Loscutoff, L.J. Lowenstine, R. Marin 3rd, P.E. Miller, W.A. McLellan, P.D. Moeller, C.L. Powell, T. Rowles, P. Silvagni, M. Silver, T. Spraker, V. Trainer, and F.M. Van Dolah. 2000. Mortality of sea lions along the central California coast linked to a toxic diatom bloom. Nature 6;403:80–4.
Shumway, S.E., S.M. Allen, and P. Dee Boersma. 2003. Marine birds and harmful algal blooms: sporadic victims or under-reported events? Harmful Algae 2:1–17.
Silber, G., D. Weller, R. Reeves, J. Adams, and T. Moore. 2021. Co-occurrence of gray whales and vessel traffic in the North Pacific Ocean. Endangered Species Research 44:177–201.
Siniff, D.B., T.D. Williams, A.M. Johnson, and D.L. Garshelis. 1982. Experiments on the response of sea otters Enhydra lutris to oil contamination. Biological Conservation 23:261–272.
Smith, M.A., B.K. Sullender, W.C. Koeppen, K.J. Kuletz, H.M. Renner, and A.J. Poe. 2019. An assessment of climate change vulnerability for Important Bird Areas in the Bering Sea and Aleutian Archipelago. PLoS ONE.
Smol, J.P., A.P. Wolfe, H.J.B. Birks, M.S.V. Douglas, V.J. Jones, A. Korhola, R. Pienitz, K. Rühland, S. Sorvari, D. Antoniades, S.J. Brooks, M.-A. Fallu, M. Hughes, B.E. Keatley, T.E. Laing, N. Michelutti, L. Nazarova, M. Nyman, A.M. Paterson, B. Perren, R. Quinlan, M. Rautio, É. Saulnier-Talbot, S. Siitonen, N. Solovieva, and J. Weckström. 2005. Climate-driven regime shifts in the biological communities of arctic lakes. Proceedings of the National Academy of Sciences 102:4397–4402.
Sowl, K., D. Granfors, K. DuBour, K. Howell, and M. Winfree. 2021. Izembek National Wildlife Refuge Priority Resources of Concern.

SRB&A. 2024. Nuiqsut Caribou Subsistence Monitoring Project: 2022 (Year 15) Report. Final Report Submitted to Conocophillips Alaska, Inc. And North Slope Borough Department of Wildlife Management, Braund, Stephen R. & Associates, Anchorage, Alaska.

Stabeno, P.J., N.B. Kachel, S.E. Moore, J.M. Napp, M. Sigler, A. Yamaguchi, and A.N. Zerbini. 2012. Comparison of warm and cold years on the southeastern Bering Sea shelf and some implications for the ecosystem. Deep Sea Research Part II: Topical Studies in Oceanography 65–70:31–45.

Starr, M., S. Lair, S. Michaud, M. Scarratt, M. Quilliam, D. Lefaivre, M. Robert, A. Wotherspoon, R. Michaud, N. Ménard, G. Sauvé, S. Lessard, P. Béland, and L. Measures. 2017. Multispecies mass mortality of marine fauna linked to a toxic dinoflagellate bloom. H. G. Dam, editor. PLOS ONE 12:e0176299.

State of Alaska. 2026. Community database online – Alaska Department of Commerce, Community, and Economic Development certified population. Alaska Department of Commerce, Community, and Economic Development, Division of Community and Regional Affairs. .Accessed online at: https://dcra-cdo-dcced.opendata.arcgis.com/

Stehn, R.A., R.M. Platte, D.K. Marks, J.G. King, and D.J. Groves. 2008. Aerial surveys of birds near the grounded M/V Selendang Ayu on the northwest coast of Unalaska Island, Alaska, January 2005. Pre-Assessment Data Report: Final Report, U.S. Fish and Wildlife Service, Migratory Bird Management, Alaska Region, Anchorage, Alaska.

Stewart, B.C., K.E. Kunkel, L.E. Stevens, L. Sun, and J.E. Walsh. 2013. Regional Climate Trends and Scenarios for the U.S. National Climate Assessment : Part 7. Climate of Alaska. NOAA technical report NESDIS, U.S. National Climatic Data Center.

Stillman, R.A., E.M. Rivers, W. Gilkerson, K.A. Wood, B.A. Nolet, P. Clausen, H.M. Wilson, and D.H. Ward. 2021. Predicting impacts of food competition, climate, and disturbance on a long-distance migratory herbivore. Ecosphere 12:e03405.

Terrados, J., C.M. Duarte, L. Kamp-Nielsen, N.S.R. Agawin, E. Gacia, D. Lacap, M.D. Fortes, J. Borum, M. Lubanski, and T. Greve. 1999. Are seagrass growth and survival constrained by the reducing conditions of the sediment? Aquatic Botany 65:175–197.

Tinker, M.T., J.L. Bodkin, L. Bowen, B. Ballachey, G. Bentall, A. Burdin, H. Coletti, G. Esslinger, B.B. Hatfield, M.C. Kenner, K. Kloecker, B. Konar, A.K. Miles, D.H. Monson, M.J. Murray, B.P. Weitzman, and J.A. Estes. 2021. Sea otter population collapse in southwest Alaska: assessing ecological covariates, consequences, and causal factors. Ecological Monographs 91:e01472.

Tippery, A.C. 2013. A temporal comparison of the eelgrass (Zostera marina L.) food web and community structure at Izembek Lagoon, Alaska from the mid-1970's to 2008. Master's Thesis, University of Alaska Fairbanks, Fairbanks, Alaska.

Thometz, N.M., M.T. Tinker, M.M. Staedler, K.A. Mayer, and T.M. Williams. 2014. Energetic demands of immature sea otters from birth to weaning: implications for maternal costs, reproductive behavior and population-level trends. Journal of Experimental Biology 217:2053–2061.

Trombulak, S.C., and C.A. Frissell. 2000. Review of ecological effects of roads on terrestrial and aquatic communities. Conservation biology 14:18–30.

Troy, D.M., and S.R. Johnson. 1989. Marine birds. Outer continental shelf environmental assessment program: final reports of principal investigators, U.S. Department of Commerce, U.S. Department of the Interior.

UC Davis Veterinary Medicine. 2026. H5 Influenza A Outbreak in Marine Mammals. Institute for Pandemic Insights. University, Davis, California. <https://pandemicinsights.ucdavis.edu/h5-marine-outbreak?_gl=1*1kbbmgk*_gcl_au*MTkwOTk0ODQ5Ny4xNzc0MDI0Njg0*_ga*MTc5NTA2MDM1MC4xNzc0MDI0Njgz*_ga_2N9JP0W2PC*czE3NzQwMzAxMTIkbzIkZzEkdDE3NzQwMzAxMTkkajUzJGwwJGgw>. Accessed 20 Mar 2026.

Udevitz, M.S., J.L. Bodkin, and D.P. Costa. 1995. Detection of Sea Otters in Boat-Based Surveys of Prince William Sound, Alaska. Marine Mammal Science 11:59–71.

U.S. National Office for Harmful Algal Blooms. 2019. Impacts of HABs on Marine Mammals. Harmful Algae. Woods Hole Oceanographic Institution. <https://hab.whoi.edu/impacts/impacts-wildlife/marine-mammals/>.

USACE. 2003. King Cove access project Environmental Impact Statement. Record of Decision January 22, 2004, Alaska District, Anchorage, Alaska.

USCB. 2020a. 2020 Decennial Census, King Cove City, Alaska Profile. United States Census Bureau. <https://data.census.gov/profile/King_Cove_city,_Alaska?g=160XX00US0239410>. Accessed 21 Aug 2025.

USCB. 2020b. 2020 Decennial Census, Cold Bay City, Alaska Profile. United States Census Bureau. <https://data.census.gov/profile/Cold_Bay_city,_Alaska?g=160XX00US0216530>.>. Accessed 21 Aug 2025.

USCB. 2020c. 2020 Decennial Census Data. United States Census Bureau. <https://data.census.gov/>. Accessed 8 Apr 2026.

USCB. 2020d. 2020 Decennial Census, Sand Point City, Alaska Profike. United States Census Bureau. <https://data.census.gov/all?q=Sand+Point+city,+Alaska>. Accessed 7 Apr 2026.

USDA Animal and Plant Health Inspection Service. 2026. Detections of Highly Pathogenic Avian Influenza in Wild Birds. Online Database. <https://www.aphis.usda.gov/livestock-poultry-disease/avian/avian-influenza/hpai-detections/wild-birds?page=1>.

USFWS. 1969. Izembek National Wildlife Range, Alaska, master plan.

USFWS. 1986. Proposal for the Designation of Izembek Lagoon as a Wetland of International Importance under the RAMSAR Convention. Unpublished Report Prepared By J. Andrew, Division of Realty, Anchorage, Alaska.

USFWS. 2002a. Breeding biology of Steller’s eiders nesting near Barrow, Alaska, 2002. Unpublished Report Prepared by T. Obritschkewitsch and P. Martin, Northern Alaska Fish and Wildlife Field Office, Fairbanks, Alaska.

USFWS. 2002b. Steller’s eider recovery plan. Northern Alaska Fish and Wildlife Field Office, Fairbanks, Alaska.

USFWS. 2003. Historical Review of the Use of Motorized Vehicles on Lands Administered by Izembek Refuge. Unpublished Report prepared by B. Glaspell and H. Clough, U.S. Fish and Wildlife Service.

USFWS. 2004a. Izembek National Wildlife Refuge 2004 biological program review. Unpublished Report Prepared by K. Sowl, Izembek National Wildlife Refuge, Cold Bay, Alaska.

USFWS. 2004b. Effects of oil spills on wildlife and habitat. USFWS Alaska Region, Anchorage, AK.

USFWS. 2010. Intra-agency Biological Assessment for Proposed 2010 Alaska Migratory Bird Spring / Summer Subsistence Hunt for Threatened species: Spectacled eider (Somateria fischeri) and Steller's eider (Polysticta stelleri). Division of Migratory Bird Management, Anchorage, Alaska.

USFWS. 2013. Southwest Alaska distinct population segment of the northern sea otter (Enhydra lutris kenyoni) recovery plan. Marine Mammals Management Office, Anchorage, Alaska.

USFWS. 2017. Biological Opinion for the Oil and Gas Activities associated with Lease Sale 244. Biological Opinion Prepared by Anchorage Fish and Wildlife Conservation Office., U.S. Fish and Wildlife Service, Anchorage Field Office.

USFWS. 2019. Status assessment of the Alaska breeding population of Steller's eiders. Northern Alaska Fish and Wildlife Field Office, Fairbanks, Alaska.

USFWS. 2020. Species status assessment report for the Southwest Distinct Population Segment of the Northern Sea Otter (Enhydra lutris kenyoni), Version 2.0. U.S. Fish and Wildlife Service, Anchorage, Alaska.

USFWS. 2021a. Revised Recovery Plan for the Alaska-breeding Population of Steller's Eider (Polysticta stelleri). Northern Alaska Fish and Wildlife Field Office, Fairbanks, Alaska.

USFWS. 2021b. Southwest Distinct Population Segment of the Northern Sea Otter (Enhydra lutris kenyoni) 5-Year Review: Summary and Evaluation. U.S. Fish and Wildlife Service, Marine Mammals Management, Anchorage, Alaska.

USFWS. 2023a. Northern sea otter stock assessment report: southcentral Alaska stock. Marine Mammals Management Office, Anchorage, Alaska.

USFWS. 2023b. Proposed Incidental Harassment Authorization for southcentral Alaska stock of northern sea otters in Cordova, Alaska. U.S. Fish and Wildlife Service, Anchorage, Alaska.

USFWS. 2024a. Izembek National Wildlife Refuge Land Exchange/Road Corridor Draft Supplemental Environmental Impact Statement. U.S. Fish and Wildlife Service, National Wildlife Refuge System.

USFWS. 2025a. Biological Assessment for the Proposed Action for the 2025 Izembek Land Exchange and Road Corridor, Izembek National Wildlife Refuge, Alaska. Prepared by AECOM, U.S. Fish and Wildlife Service, Alaska Region Headquarters.

USFWS. 2025b. Species Status Assessment for the Alaska-breeding Population of Steller's Eiders (Polysticta stelleri). Northern Alaska Fish and Wildlife Field Office, Fairbanks, Alaska.

USFWS. 2025c. Biological Opinion for Migratory Bird Subsistence Hunting in Alaska: Regulations for the 2025 Spring/Summer Harvest. Biological Opinion, U.S. Fish and Wildlife Service, Northern Alaska Field Office.

USFWS. 2025d. Alaska-breeding population of Steller's eiders (Polysticta stelleri) 5-year review: summary and evaluation. Northern Alaska Fish and Wildlife Field Office, Fairbanks, Alaska.

USFWS. 2025e. ANILCA Section 810 Analysis of Subsistence Impacts for the Proposed 2025 Land Exchange in Izembek National Wildlife Refuge, Alaska. Anchorage, Alaska.

USFWS. 2026. Biological Opinion for the Migratory Bird Subsistence Hunting in Alaska: Regulations for the 2026 Spring/Summer Harvest. Biological Opinion, U.S. Fish and Wildlife Service, Northern Alaska Field Office.

USFWS/Dau. 1999. Aerial survey of emperor geese and other waterbirds in southwestern Alaska, Spring 1998. Unpublished Report Prepared by C. Dau, U.S. Fish and Wildlife Service, Migratory Bird Management.

USFWS/Dick and Dick. 1971. The natural history of Cape Pierce and Nanvak Bay, Cape Newenham National Wildlife Refuge, Alaska. Unpublished Report Prepared by M.H. Dick and L.S. Dick, Bethel, Alaska.

USFWS/Lance et al. 2007. Survival of Wintering Steller's Eiders (Polysticta stelleri) within the Izembek Critical Habitat Unit. Science Support Partnership, Unpublished Report prepared by Ellen W. Lance, Tyler Lewis, and Paul Flint, U.S. Fish and Wildlife Service and U.S. Geological Survey, Anchorage, Alaska.

USFWS/Larned. 1998. Steller's eider spring migration survey, southwest Alaska, 1998. Unpublished Report Prepared by W.W. Larned, Northern Alaska Fish and Wildlife Field Office, Fairbanks, Alaska.

USFWS/Larned. 2000. Aerial Surveys of Steller's eiders (Polysticta stelleri) and other waterbirds and marine mammals in Southwest Alaska areas proposed for navigation improvements by the U. S. Army Corps of Engineers, Alaska. Unpublished Report Prepared by W.W. Larned, Migratory Bird Management, Anchorage, Alaska.

USFWS/Larned. 2006. Winter distribution and abundance of Steller's eiders (Polysticta stelleri) in Cook Inlet, Alaska, 2004-2005. Unpublished Report Prepared by W.W. Larned, Migratory Bird Management, Anchorage, Alaska.

USFWS/Larned. 2012a. Steller's eider spring migration surveys southwest Alaska 2012. Unpublished Report Prepared by W.W. Larned, U.S. Fish and Wildlife Service, Migratory Bird Management, Anchorage, Alaska.

USFWS/Larned. 2012b. Steller's eider spring migration surveys, southwest Alaska 2011. Unpublished Report Prepared by W.W. Larned, Migratory Bird Management, Anchorage, Alaska.

USFWS/Larned et al. 1993. Steller's Eider Spring Migration Surveys Southwest Alaska 1992-193. Unpublished Report Prepared by W.W. Larned, W.I. Butler, and G.R. Balogh, Migratory Bird Management, Anchorage, Alaska.

USFWS/Obritschkewitsch and Martin. 2001. Breeding biology of Steller's eiders nesting near Barrow, Alaska, 1999-2000. Unpublished Report Prepared by T. Obritschkewitsch and P. Martin, Northern Alaska Fish and Wildlife Field Office, Fairbanks, Alaska.

USFWS/Obritschkewitsch and Martin. 2002. Breeding biology of Steller's eiders nesting near Barrow, Alaska, 2001. Unpublished Report Prepared by T. Obritschkewitsch and P. Martin, Northern Alaska Fish and Wildlife Field Office, Fairbanks, Alaska.

USFWS/Rojek. 2006. Breeding biology of Steller's eiders nesting near Barrow, Alaska, 2005. Unpublished Report Prepared by N.A. Rojek, Northern Alaska Fish and Wildlife Field Office, Fairbanks, Alaska.

USFWS/Russell. 2004. Richard Russell's Alaska Steller's Eiders Notes, 1969 to Present. U.S. Fish and Wildlife Service, Anchorage, Alaska.

USFWS/Safine. 2011. Breeding ecology of Steller's and spectacled eiders nesting near Barrow, Alaska, 2008–2010. Unpublished Report Prepared by D. Safine, Northern Alaska Fish and Wildlife Field Office, Fairbanks, Alaska.

USFWS/Safine. 2012. Breeding ecology of Steller's and spectacled eiders nesting near Barrow, Alaska, 2011. Unpublished Report Prepared by D. Safine, Northern Alaska Fish and Wildlife Field Office, Fairbanks, Alaska.

USFWS/Trust et al. 1997. Environmental contaminants in three eider species from Alaska and Arctic Russia. Unpublished Report Prepared by K.A. Trust, J.F. Cochrane, and J.H. Stout, Alaska Region Ecological Services, Anchorage, Alaska.
USFWS/Wilk et al. 1986. Abundance, age composition, and observations of emperor geese in Cinder lagoon, Alaska Peninsula, 17 September - 10 October 1986. Unpublished Report Prepared by R.J. Wilk, K.I. Wilk, and R.C. Kuntz, King Salmon, Alaska.
USFWS/Williams. 2023. Izembek Wilderness Aerial Imagery Projects, 2004-2022. Unpublished Report Prepared by A.R. Williams, U.S. Fish and Wildlife Service, Izembek National Wildlife Refuge.
USFWS/Williams et al. 2016. Molting Pacific Steller's Eider surveys in southwest Alaska 2016. Unpublished Report. Unpublished Report Prepared by A.R. Williams, T.D. Bowman, and B.S. Shults., U.S. Fish and Wildlife Service, Migratory Bird Management, Anchorage, Alaska.
USFWS/Wilson. 2019*a*. Fall Izembek Brant Aerial Survey, Alaska 2018. Unpublished Report by H.M. Wilson, Migratory Bird Management, Anchorage, Alaska.
USFWS/Wilson. 2019*b*. Alaska Winter brant aerial survey, Izembek Lagoon Complex and Sanak Islands, Alaska, 2019. Unpublished Report Prepared by H. Wilson, U.S. Fish and Wildlife Service, Migratory Bird Management, Anchorage, Alaska.
USFWS/Wilson and Larned. 2020. Alaska Winter Brant Surveys 2020. Unpublished Report prepared by H. Wilson and W. Larned, U.S. Fish and Wildlife Service, Migratory Bird Management, Anchorage, Alaska.
USFWS/Wilson and Larned. 2021. Alaska Winter Brant Surveys 2021. Unpublished Report prepared by H. Wilson and W. Larned, U.S. Fish and Wildlife Service, Migratory Bird Management, Anchorage, Alaska.
USFWS/Wilson and Larned. 2022. Alaska Winter Brant Surveys 2022. Unpublished Report prepared by H. Wilson and W. Larned, U.S. Fish and Wildlife Service, Migratory Bird Management, Anchorage, Alaska.
USFWS/Wilson and Larned. 2023. Alaska Winter Brant Surveys 2023. Unpublished Report prepared by H. Wilson and W. Larned, U.S. Fish and Wildlife Service, Migratory Bird Management, Anchorage, Alaska.
USFWS/Wilson and Larned. 2024. Alaska Winter Brant Surveys 2024. Unpublished Report prepared by H. Wilson and W. Larned, U.S. Fish and Wildlife Service, Migratory Bird Management, Anchorage, Alaska.
USFWS/Wilson et al. 2025. Population indices, trends, and distribution of breeding waterbirds on the Arctic Coastal Plain, Alaska, 2007-2024. U.S. Fish and Wildlife Service, Migratory Bird Management.
USGS. 2019. Monitoring annual trends in the abundance of eelgrass (Zostera marina) at Izembek National Wildlife Refuge in 2018. Open-File Report 2019–1042 Prepared by D.H. Ward and C.L. Amundson, U.S. Geological Survey, Reston, VA.
Van Hemert, C., J.R. Harley, G. Baluss, M.M. Smith, R.J. Dusek, J.S. Lankton, D.R. Hardison, S.K. Schoen, and R.S.A. Kaler. 2022. Paralytic shellfish toxins associated with Arctic Tern mortalities in Alaska. Harmful Algae 117:102270.
VanBlaricom, G.R., and J.A. Estes. 1988. The Community Ecology of Sea Otters. Ecological Studies, Springer.
Vanderlaan, A.S.M., and C.T. Taggart. 2007. Vessel Collisions with Whales: The Probability of Lethal Injury Based on Vessel Speed. Marine Mammal Science 23:144–156.

Ward, D.H., K.R. Hogrefe, T.F. Donnelly, L.L. Fairchild, K.M. Sowl, and S.C. Lindstrom. 2022. Abundance and distribution of eelgrass (Zostera marina) and seaweeds at Izembek National Wildlife Refuge, Alaska, 2007–10. Open-File Report. Open-File Report, U.S. Geological Survey.

Ward, D.H., C.J. Markon, and D.C. Douglas. 1997. Distribution and stability of eelgrass beds at Izembek Lagoon, Alaska. Aquatic Botany 58:229–240.

Ward, D.H., R.A. Stehn, and D.V. Derksen. 1994. Response of Staging Brant to Disturbance at the Izembek Lagoon, Alaska. Wildlife Society Bulletin 22:220–228.

Watanabe, H., M. Ito, A. Matsumoto, and H. Arakawa. 2016. Effects of sediment influx on the settlement and survival of canopy-forming macrophytes. Scientific Reports 6:18677.

Watts, D.E., L.G. Butler, B.W. Dale, and R.D. Cox. 2010. The Ilnik wolf Canis lupus pack: use of marine mammals and offshore sea ice. Wildlife Biology 16:144–149. <https://nsojournals.onlinelibrary.wiley.com/doi/10.2981/09-040>. Accessed 1 May 2026.

Waycott, M., C.M. Duarte, T.J.B. Carruthers, R.J. Orth, W.C. Dennison, S. Olyarnik, A. Calladine, J.W. Fourqurean, K.L. Heck, A.R. Hughes, G.A. Kendrick, W.J. Kenworthy, F.T. Short, and S.L. Williams. 2009. Accelerating loss of seagrasses across the globe threatens coastal ecosystems. Proceedings of the National Academy of Sciences 106:12377–12381.

Xie, Z., J. Yang, W. Jiao, X. Li, M. Iqbal, M. Liao, and M. Dai. 2025. Clade 2.3.4.4b highly pathogenic avian influenza H5N1 viruses: knowns, unknowns, and challenges. Journal of Virology 99:e00424-25.

Yeates, L.C., T.M. Williams, and T.L. Fink. 2007. Diving and foraging energetics of the smallest marine mammal, the sea otter (Enhydra lutris). Journal of Experimental Biology 210:1960–1970.

Zabarte-Maeztu, I., F.E. Matheson, M. Manley-Harris, R.J. Davies-Colley, M. Oliver, and I. Hawes. 2020. Effects of Fine Sediment on Seagrass Meadows: A Case Study of Zostera muelleri in Pāuatahanui Inlet, New Zealand. Journal of Marine Science and Engineering 8:645.

Zhu, L., R. Anello, K. Rühland, M.F.J. Pisaric, S.V. Kokelj, T. Prince, and J.P. Smol. 2019. Impacts of Road Dust on Small Subarctic Lake Systems. ARCTIC 72:434–457.

Žydelis, R., Svein-Hakon Lorentsten, Anthony D. Fox, Andres Kuresoo, Yuri Krasnov, Yuri Goryaev, Jan Ove Bustnes, Martii Hario, Leif Nilsson, and Antra Stipniece. 2006. Recent changes in the status of Steller's Eider Polysticta stelleri wintering in Europe: a decline or redistribution? Bird Conservation International 16:217–236.

APPENDIX A

Quantifying Increased Hunting Rates in Izembek Lagoon Due to the Proposed Action

Construction of a new road connecting King Cove and Cold Bay would likely result in increased access for hunting activities in Izembek Lagoon. The construction of the road improves overland motorized access and shortens walking distances to Izembek Lagoon, lowering logistical constraints on hunting activity. In order to assess effects of increase access to the lagoon, we needed to calculate current hunting use (environmental baseline) and to project future hunting use. Quantification of these increases is necessary to determine effects to the listed Steller's eider and northern sea otter. Sea otters are not the target of this hunting activity but would also experience increased levels of disturbance in Izembek Lagoon as a result.

A.1 Sport Hunting

We use Client Use Days (CUDs), defined as the number of days a hunter was taken on the Refuge by a commercial guide, to measure changes in sport hunting intensity through time (USFWS/Izembek Refuge, unpublished data). The CUDs provide a measure of hunting effort, compared to the other data available on commercial hunter numbers. One hunter could hunt for multiple intensive days and this is captured in CUDs but not in 'hunter number' data. These data include upland gamebird hunting efforts, although those efforts are usually combined with waterfowl hunting

A.1.1 Establishing Baseline Client Use Days

Using CUDs as a measure of sport hunting, we needed to establish a baseline hunting level (prior to the proposed action). In the most recent 5 years, four commercial guide services have been available with high variability in the number of CUDs reported.

In 2021, 813 CUDs were reported; this is the highest number ever reported. This increase was likely caused by several factors: 1) a new guide service began operation in 2021, increasing the total number of guides from three to four (USFWS, Izembek Refuge, unpublished data); 2) guide services continued to shift to use of vessel-based hunting rather than shoreline-based hunting, improving logistics and access (M. Fosado, USFWS, pers. comm. 2025); and 3) there was likely an increased interest in hunting and improvement in logistics following a reduction in travel restrictions as the country adjusted to the global pandemic experienced in 2020 – national data demonstrate a substantial increase and participation in outdoor recreation from 2020 to 2021 (BEA 2023). This pandemic-caused increase is also likely reflected in the fall 2020 CUDs.

From 2022 to 2024, the annual CUDs with four guides appeared to level off with CUDs ranging from 648 to 691 (Table A-1 and Figure 13). In 2025, the brant harvest season was shortened from September 1 through December 16 in previous years to October 1 to November 20. With the regulatory change in number of harvest days open for hunters, the reported CUDs in 2025 dropped to 460 CUDs or a 29 percent change from the prior year.

With three typical years (2022 to 2024), one high year (2021), and one low year (2025), we consider the average CUDs of the past 5 years to be our baseline level from which to compare future activity. The average from 2021 to 2025 was 652.2 CUDs. Similar variability occurred in the most recent 5 years with three guides (2016 to 2020); in 2016 there were regulation changes increasing brant bag limits (from two to three), and in 2020 the pandemic may have led to the increase in CUDs.

TABLE A-1. Annual reported client use days, total guide operations, and total birds harvested during commercially guided hunting on Izembek Refuge. These data include upland gamebird hunting efforts, although those efforts are usually combined with waterfowl hunting. Birds per client use day is a calculated estimate. Source: USFWS/Izembek Refuge, unpublished data.

Year	Total Client Use Days	Total Guide Operations	Birds Harvested	Birds per Client Use Day
2009	72	2	317	4.40
2010	160	3	971	6.07
2011	154	3	905	5.88
2012	196	3	1,054	5.38
2013	232	3	1,211	5.22
2014	192	3	405	2.11
2015	185	3	646	3.49
2016	288	3	406	1.41
2017	315	3	1,127	3.58
2018	249	3	331	1.33
2019	282	3	1,098	3.89
2020	396	3	254	0.64
2021	813	4	1,765	2.17
2022	691	4	1,517	2.20
2023	648	4	1,443	2.23
2024	649	4	2,280	3.51
2025	460	4	Not available	Not available

A.1.2. Estimating the Effect of the Action on Client Use Days in Izembek Lagoon

We predict construction of a road would result in increased sport hunting (guided and non-guided) at Izembek Refuge and in the Izembek Lagoon. The construction of a road would lower logistical constraints to participate in sport hunting activities. The existence of a road would increase opportunities for visiting non-residents to access the lagoon from locations along the road. It would also increase recreational interest (including by hunters) in visiting the area given the larger road system and increased access provided by it. To establish a reasonable proxy for the effect of increasing access and lowering logistical constraints, we compared commercial use data from when there were three guide services in Cold Bay (2009 to 2020) to when there were four guide services in Cold Bay (2021 to 2025). We assume that the change from three to four guide services (removal of a logistical constraint on sport hunting) would mimic the effect of the proposed action (also removing a logistical constraint by providing easier access via the road). We are not saying the road will necessarily cause a new guide service to open (though it is possible); we are saying that the overall effect of the road would generate increased interest and access to Izembek lagoon for hunting over the 50-year lifetime of the road and that our best way to quantify it is through the observed change in recent years from three to four guide services.

We calculated a lower and upper estimate of CUDs due to the effect of the action:

► *Lower Estimate*

The increase in average CUDs from the 5 years with four guide services compared to the most recent 5 years with three guide services. We used the 5-year average with four guides as a lower estimate because it encompasses variability in hunting effort due to unknowable events – pandemics, regulation changes. We did not use the 2025 low data because we have no guarantee the changes in regulations lowering harvest will continue into the future and we err conservatively for the species.

$$\frac{(813 + 691 + 648 + 649 + 460)}{5} \div \frac{(288 + 315 + 249 + 282 + 396)}{5} = 2.13$$

Given our baseline of 652.2 CUDs, this results in a lower estimate of 1,389 CUDs due to the effect of the action.

$$652.2 \text{ CUDs } \times 2.13 \text{ rate of increase} = 1{,}389.19 \text{ CUDs}$$

► *Upper estimate*

The increase in CUDs from the peak year with four guide services in 2021 relative to the most recent 5 years with three guide services. We use the peak as our upper estimate because over the 50-year lifetime of the road there is considerable uncertainty and high years of harvest are anticipated.

$$813 \div \frac{(288 + 315 + 249 + 282 + 396)}{5} = 2.66$$

Given our baseline of 652.2 CUDs, this results in an upper estimate of 1,735 CUDs due to the effect of the action.

$$652.2 \text{ CUDs } \times 2.66 \text{ rate of increase} = 1{,}734.85 \text{ CUDs}$$

A.1.3 Assumptions

- We assume the increase in CUDs resulting from increased access following road construction will mirror the increase in CUDs observed during the shift from three guides to four guide services.
- We assume Cold Bay or King Cove has the infrastructure capacity to support an increase in sport hunting guide services and/or increased visitation by non-guided hunters. While Cold Bay is a small geographically restricted community and there may not currently be the capacity or infrastructure to support additional guide services, in the next 50 years such increases are anticipated. Alternatively, King Cove could add a guide service that uses the road to access Izembek Lagoon (either from hiking off the road or via the boat launch). This could be uneconomical due to the length of the drive or economical because of the aesthetic and recreational value of the drive to one of the premier waterfowl destinations in the world. If there is no expansion in guide service, we have likely overestimated the relative increase in sport hunting activity anticipated following construction of a road.
- We assume averaging the 5 years of CUDs with four guides is a reasonable approximation of the baseline for current use.
- We assume the shift from three to four guide services adequately accounts for both increased guided sport hunter effort and increased non-guided sport hunter effort due to access provided by the road.

A.2 Subsistence Harvest

We lack current data on the level of activity/effort currently made by subsistence harvesters in Cold Bay and King Cove. This makes it difficult to directly compare subsistence harvest activity to sport hunting activity and know what the relative changes will be for each; we do not have a quantification of these two activities in the same units of measure.

The Alaska Department of Fish and Game collected data on the weight of game harvested by subsistence users in 2016 (Table A-2). With this as our best available data, we determined a method to calculate a subsistence use equivalent to the CUDs reported for sport hunters. Using the reported weight of subsistence harvest by resource category (e.g., Ducks) (ADF&G 2025) and dividing that by the average weight of that resource category (USFWS/Wentworth 2007), we can determine the number of individual birds harvested. If we assume the effort to harvest a bird is similar for sport hunters and subsistence users, we can then use the reported birds per CUD for sport hunters and apply the same division factor to calculate the final CUD-equivalent for subsistence uses.

To calculate the number of birds harvested, we used the estimated pounds harvested from three categories of the 2016 ADF&G subsistence harvest data: Ducks (general category including all species of ducks), Black Brant, and Canada geese. When combined, these species made up 93 percent and 96 percent of the total migratory bird harvest in King Cove and Cold Bay, respectively (ADF&G 2016). Using data from Alaska, the average weight of an ‘unidentified duck’ is 2.00 pounds, the average weight of a black brant is 3.04 pounds, and the average weight of a Taverner's goose is 5.30 pounds (USFWS/Wentworth 2007). Using these numbers, we can estimate the total birds harvested in each community, per Table A-2.

TABLE A-2. Reported subsistence harvest activity in Cold Bay and King Cove in 2016 by three bird types – ducks, brant, and Canada goose. These bird types made up 93 percent and 96 percent of the total migratory bird harvest in King Cove and Cold Bay, respectively. Source: ADF&G 2025: Community Subsistence Information System.

Community	Bird Type	Pounds Harvested	Average Weight of Bird Type	Estimated Birds (pounds harvest/average weight of bird)	Total Birds (sum of 3 bird types)
Cold Bay	Ducks	197.1	2.00	98.55	332.68
	Brant	546.9	3.04	179.90	
	Canada Goose	287.4	5.30	54.23	
King Cove	Ducks	842.5	2.00	421.25	1,079.63
	Brant	1,268.2	3.04	417.17	
	Canada Goose	1,278.4	5.30	241.21	

Next, we can use the populations of each community to estimate the number of birds harvested per person (total birds harvested ÷ populations size), a rate of approximately 5.28 birds per person in Cold Bay and 2.05 birds per person in King Cove. Using the sport hunting data from 2016 (Table A-1), we can calculate the number of birds harvested per CUD (406 birds harvested ÷ 288 client use days in 2016), a rate of approximately 1.41 birds per CUD. Using these numbers, we can compare the effort it takes to harvest a bird for a subsistence hunter relative to the effort to harvest a bird on a client use day. Thus, we calculate a CUD equivalent of 3.74 for Cold Bay and 1.45 for King Cove (birds per person in each community ÷ birds per client use day in 2016). Assuming the harvest effort is similar now to 2016, multiplying the current population estimate by the CUD equivalent for that community yields an estimation of CUD equivalents for each community (Table A-3).

A.2.1 Establishing Baseline Client Use Day Equivalents

Currently, the community of Cold Bay has simple, direct access to Izembek Lagoon to hunt waterfowl. Izembek Lagoon has the highest estimates of Steller's eider numbers in the action area, including between 12 to 93 percent of the listed Alaska-breeding population depending on the season (Table 5). Izembek Lagoon has an abundance of numerous types of waterfowl making it an ideal hunting location. If we assume all of Cold Bay's subsistence waterfowl hunting occurs in Izembek Lagoon, then the baseline amount of subsistence hunting is 187 CUD equivalents (Table A-3).

Table A-3. Summary table of data used to estimate client use day equivalents for subsistence harvest and all calculated estimates. The client use day equivalents for subsistence harvest were derived from the most recent available data in 2016 and extrapolated based on current population estimates from 2020 U.S. Census. Source: ADF&G 2025: Community Subsistence Information System.

2016 DATA & ESTIMATES						**CURRENT ESTIMATES**	
Community	**Total Birds**	**Community Population (2016 ADF&G)**	**Birds Per Person**	**Sport Hunt Birds Per Client Use Day**	**Subsistence Hunt Client Use Day Per Person**	**Community Population (2020 U.S. Census)**	**Subsistence Hunt Client Use Days Equivalents**
Cold Bay	332.68	63	5.28	1.41	3.74	50	187.00
King Cove	1,079.63	527	2.05	1.41	1.45	757	1,097.65

A.2.2 Estimating the Effect of the Action on Subsistence Harvest in Izembek Lagoon

The proposed road would facilitate access to Izembek Lagoon for the community of King Cove by creating an easily navigable land route. We estimate that 50 percent of King Cove waterfowl harvest could shift to Izembek Lagoon and/or access to the Lagoon could increase the overall amount of waterfowl harvest by the King Cove Community (which currently harvests less birds per person than Cold Bay). Therefore, we estimate hunting in Izembek Lagoon would increase by approximately 548.83 CUD equivalents (1,097.65 King Cove CUD equivalents x 0.50 portion of harvest shifting to Izembek Lagoon) due to increased subsistence harvest from the community of King Cove.

A.2.3. Assumptions

- Pounds per bird is appropriate to approximate number of birds harvested.
- We only used ducks, Pacific brant, and Canada geese. We assume this adequately captures relative subsistence harvest effort, based on these three waterfowl categories accounting for more than 90 percent of total migratory bird harvest by each community.
- We assume subsistence harvest levels by the community of Cold Bay will remain unchanged following road construction.
- We assume CUDs for sport hunting are comparable to CUD equivalents for subsistence hunting.

- We assume the 2016 subsistence harvest levels were representative of a normal year and that the effort per person in 2016 is similar to effort per person now.
- We are making general assumptions of how King Cove subsistence harvest may change due to the construction of a road (i.e., a hunting amount of 50 percent of current effort would occur in Izembek Lagoon – either through shifting of existing harvest or additional harvest because of new access). We acknowledge this may be an overestimate in the near term; we think it is a reasonable assumption to accommodate for community change over the 50-year lifetime of the road.

A.3 Effect of the Action on Combined Harvest

Now that we have calculated the effect of the action on sport hunting and subsistence hunting, and the effect is in the same units (client use day equivalents), we are able to estimate the total change to hunting activity due to the proposed action. See Table A-4 for the combined effect of the action on subsistence and commercial harvest and formulas for the calculations. By combining the baseline sport (652.2 CUDs) and subsistence (187 CUD equivalents) harvest, we estimate current harvest effort at 839.20 client use day equivalents in the Izembek Lagoon. And, if we combine the estimated effect of the action on sport and subsistence harvest, we estimate harvest effort would increase to between 2,125.02 and 2,470.68 client use day equivalents. Refer to Table A-4 for the inputs and the description of these calculations. This is an approximate 2.53 to 2.94 proportional increase in total hunting activity in Izembek Lagoon due to the effect of the action (Table A-4).

At baseline, 22.2 percent of total harvest in Izembek Lagoon occurs from subsistence users in Cold Bay and 77.8 percent is from commercial use (calculated by dividing baseline sport hunting CUDs by total baseline CUDs). Given these numbers, we estimate 30 to 35 percent of the harvest in Izembek Lagoon occurs from subsistence use and 65 to 70 percent from commercial use (calculated from dividing the upper and lower estimates of sport hunting CUDs by upper and lower estimate total CUD equivalents).

Table A-4. Summary of inputs used to calculate upper and lower estimates for proportional change in harvest in Izembek Lagoon from the baseline and due to the effect of the action.

Estimate	Environmental Baseline			Condition After the Action				
	Sport Hunting (CUDs)	Cold Bay Subsistence Hunting (CUD Equivalents)	Total CUDs in Izembek[1]	Sport Hunting (CUDs)	King Cove Subsistence Hunting (CUD Equivalents)	Expected Portion of King Cove Harvest in Izembek	Total CUDs in Izembek[2]	Proportional Change in CUDs in Izembek[3]
Lower Estimate	652.2	187.00	839.20	1,389.19	1,097.65	0.5	2,125.02	2.53
Upper Estimate	652.2	187.00	839.20	1,734.85	1,097.65	0.5	2,470.68	2.94

[1]Environmental Baseline Total CUDs in Izembek =

Baseline Sport Hunting + Baseline Cold Bay Subsistence

[2]Condition After the Action Total CUDs in Izembek =

Effects Sport Hunting + Baseline Cold Bay Subsistence + (Effects King Cove Subsistence * Expect Portion of King Cove Harvest in Izembek)

[3]Proportional Change in CUDs in Izembek =

Total CUDS in Izembek from Condition After the Action ÷ Total CUDs in Izembek from Environmental Baseline

A.4 Literature Cited and Data Sources

ADF&G. 2025. Division of Subsistence - CSIS Data Downloader. <https://adfg-ak-subsistence.shinyapps.io/CSIS-Data-Downloader/>. Accessed 16 Aug 2025.

Ward, D.H., R.A. Stehn, and D.V. Derksen. 1994. Response of Staging Brant to Disturbance at the Izembek Lagoon, Alaska. Wildlife Society Bulletin 22:220–228.

USCB. 2020a. 2020 Decennial Census, King Cove City, Alaska Profile. United States Census Bureau. <https://data.census.gov/profile/King_Cove_city,_Alaska?g=160XX00US0239410>. Accessed 21 Aug 2025.

USCB. 2020b. 2020 Decennial Census, Cold Bay City, Alaska Profile. United States Census Bureau. <https://data.census.gov/profile/Cold_Bay_city,_Alaska?g=160XX00US0216530>.>. Accessed 21 Aug 2025.

USFWS/Wentworth. 2007. Subsistence Migratory Bird Harvest Survey: Bristol Bay 2001-2005. Migratory Birds and State Programs, Anchorage, Alaska.

APPENDIX B

Quantifying Increased Disturbance Rates in Izembek Lagoon due to the Proposed Action

B.1 Hunting Disturbance in Izembek Lagoon

Hunting disturbance in Izembek Lagoon is reasonably certain to increase due to the effect of the action. Here, we outline our calculations quantifying the increase in hunting disturbance from historic levels, to baseline (current) levels, and projected future levels due to the effects of the action.

B.1.1 Historic Estimates of Hunting Disturbance

A disturbance study of Pacific brant from 1985 to 1987 found hunting caused an average of 0.06 +/- 0.01 disturbance events per hour within Izembek Lagoon (Ward et al. 1994). When exposed to hunters and hunting activity, many flocks exhibited a behavioral response, ranging from increased vigilance (64.4 percent) to flight (39.2 percent). When disturbed by hunting in the lagoon, an average of 90.0 +/- 2.9 percent of individuals in disturbed brant flocks had a flight response, with an average flight duration of 96.0 +/- 18.3 seconds. While hunting, as well as boating, did not contribute greatly to the overall interruption time of the study, these activities elicited a consistent and prolonged response from brant, with 75 percent of the flocks leaving the study area in response to hunting.

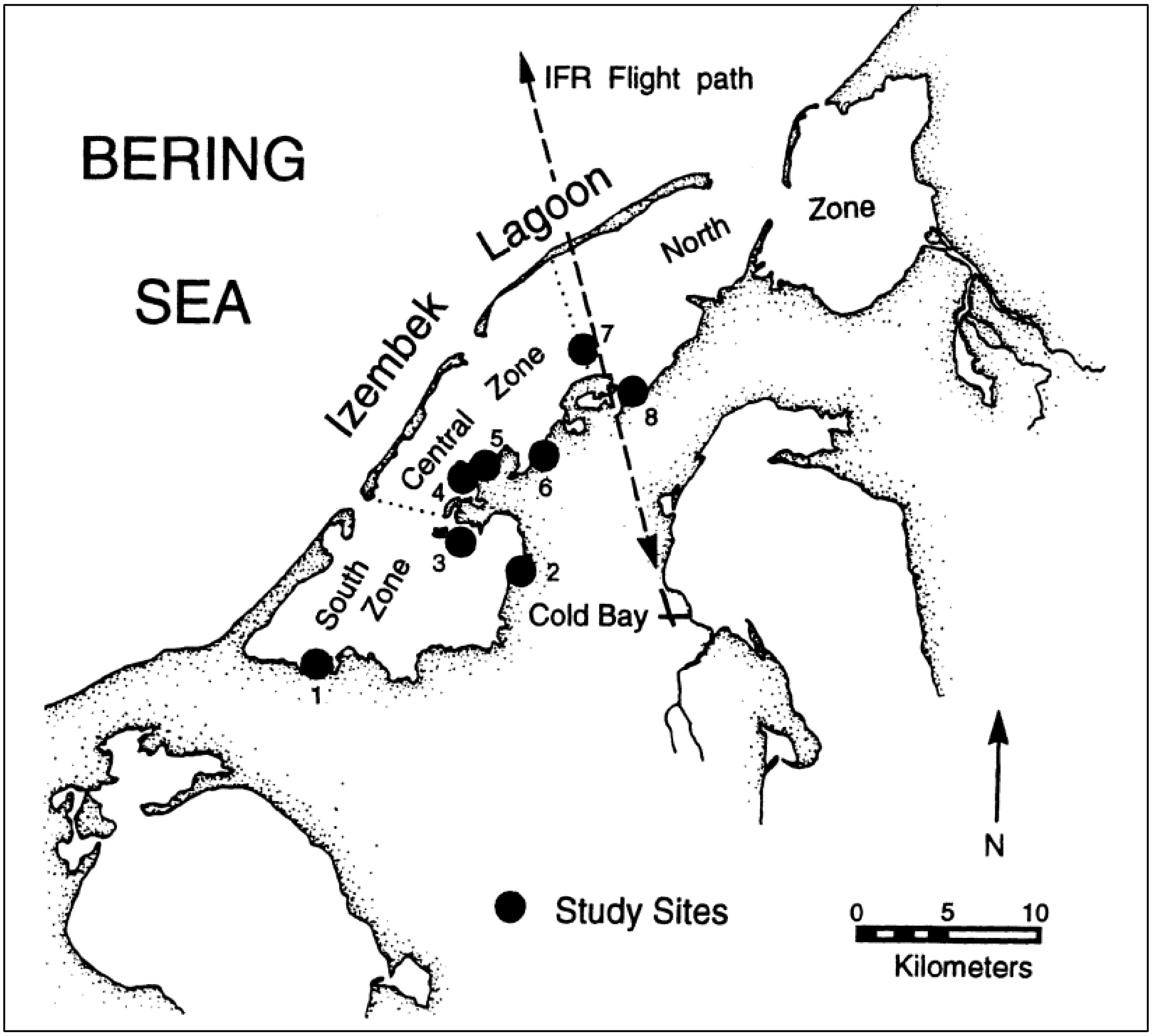

Figure B-1. Location of 8 study sites for investigating Pacific brant disturbance in Izembek Lagoon in fall 1985 to 1987. Data presented in Appendix B represents averages across these 8 study areas. The IFR (instrument flight rules) flight path marks the main instrument flight path during the study. Source: Ward et al. 1994

The study period of 1985 to 1987 occurred during a low period of human activity at Izembek Lagoon, when hunting was closed for emperor geese and bag limits were lowered from four to two brant. It is estimated that these restrictions resulted in an approximately 60 percent decline in waterfowl hunting activity at Izembek Lagoon during the study period (Ward et al. 1994).

Pacific brant (*Branta bernicla nigricans;* hereafter brant) is our best available proxy species for the Steller's eider in terms of their time and energy budgets during staging and migration. They are both relatively small species in their respective taxonomic groups, Steller's eiders being a small sea duck and brant a small goose. Both are arctic species that rely on energy reserves to survive molt/winter and migrate in spring to reproduce the following year. Both species breed in lowland tundra wetlands and molt in Izembek Lagoon (Maliguine 2024), as indicated in aerial surveys (USFWS 2019). Like eiders, brant migrate to staging sites to molt in coastal waters and lagoon systems, where the barrier islands provide predator refugia and where eelgrass, sedges, and algae are plentiful (Cornell Lab of Ornithology 2025). However, brant are a targeted species for both sport and subsistence hunting while Steller's eiders are closed to hunting

Using this data and accounting for 1985 to 1987 having an approximately 60 percent decrease in typical hunting activity, we calculated the following upper and lower estimates of historic disturbance rates during the fall:

► *Disturbance events per hour*
Historic lower estimate: 0.06 disturbance events per hour
Historic upper estimate:

$$(0.06\ disturbance\ per\ hour) \div (40\ percent\ hunting\ volume) = (X\ disturbance\ per\ hour) \div (100\ percent\ hunting\ volume)$$

$$X = (0.06 \div 40) \times 100 = 0.15\ disturbance\ events\ per\ hour$$

Using these rates and reported data on 1) the percent of events that elicited a certain response, 2) length of the response, and 3) percent of the flock taking flight, we can calculate an upper and lower estimate of the mean interruption time per hour (both flight and all responses) of brant due to hunting disturbances in Izembek Lagoon (Table B-1).

► *Seconds of flight per hour*

$$Disturbance\ events\ per\ hour \times Percent\ yielding\ flight\ response \times Average\ length\ of\ flight \times Percent\ of\ flock\ responding = Seconds\ of\ flight\ response\ per\ hour$$

Historic lower estimate: 2.03 seconds of flight response per hour
Historic upper estimate: 5.08 seconds of flight response per hour

► *Seconds of all disturbance per hour*

$$Disturbance\ events\ per\ hour \times Percent\ yielding\ any\ response \times Average\ length\ of\ responses \times Percent\ of\ flock\ responding = Seconds\ of\ response\ per\ hour$$

Historic lower estimate: 4.50 seconds of response per hour
Historic upper estimate: 11.24 seconds of response per hour

Table B-1. The effect of hunting-caused disturbance on brant in Izembek Lagoon from 1985 to 1987. Lower estimates are the levels observed during the three-year study and upper estimates are calculated based on the study occurring in a year where hunting occurred at 60 percent of typical levels. Source: Ward et al. 1994

Hunting Disturbance		Historic				
Response Type	Estimate	Disturbance Events Per Hour	Portion of Events Eliciting Flock Response	Average Length of Flock Response (seconds)	Portion of Flock Responding	Seconds of Response Per Individual Per Hour
Flight Response	Lower	0.06	0.392	96	0.9	2.03
	Upper	0.15	0.392	96	0.9	5.08
Any Response	Lower	0.06	0.654	139.1	0.824	4.50
	Upper	0.15	0.654	139.1	0.824	11.24

B.1.2 Establishing Baseline Hunting Disturbance Rates

We estimate waterfowl hunting has increased within the Izembek Lagoon ninefold in the four decades since the Ward et al. 1994 study occurred. Pacific brant banding data indicates a threefold increase in recovery rates through the 1990s to the 2010s (Leach et al. 2017, Leach et al. 2019, Stillman et al. 2021). From the 2010s to 2025, there has been an additional threefold increase in hunting. We calculate this additional threefold increase from the average CUDs for the 2010s relative to the average CUDs from the 2020s (Table A-1), rounding up to the whole number.

Our baseline assumption for the last 10 years is that fall hunting has increased threefold based on CUD data. We do not have data to quantify subsistence harvest rates. However, we assume the majority of the change in harvest intensity in Izembek is driven by sport hunting. The reported CUDs represent guided hunts only and are assumed to underestimate total commercially supported hunting effort: commercial operators without refuge-issued special use permits rent trucks and hunting equipment to "independent" sport hunters to enable their use of the existing but limited road network to access hunting areas on State and Federal lands (Cold Bay Outfitters 2017). However, these data on CUDs also include hunting activity outside of Steller's eider usage areas and even some entirely outside the Izembek Lagoon, which may somewhat mute this discrepancy.

We expect the increase in waterfowl hunting to result in increased hunting-caused disturbance. We assume that disturbance rates will increase at a rate proportional to the increase in hunting rates (a ninefold increase). We establish the baseline disturbance rates in Izembek Lagoon by multiplying the disturbance events and the seconds of disturbance per hour by the expected increase in hunting (Table B-2).

Table B-2. Historic brant disturbance rates and response time due to hunting disturbance in Izembek Lagoon and the calculated environmental baseline values based on a ninefold increase in hunting from 1985 to 1987. Source: Ward et al. 1994.

Hunting Disturbance		Historic (1985-1987)		Environmental Baseline		
Response Type	Estimate	Disturbance Events Per Hour	Seconds of Response Per Individual Per Hour	Rate of Increase	Events Per Hour	Seconds of Response Per Individual Per Hour
Flight Response	Lower	0.06	2.03	9	0.54	18.27
	Upper	0.15	5.08	9	1.35	45.72
Any Response	Lower	0.06	4.50	9	0.54	40.5
	Upper	0.15	11.24	9	1.35	101.16

B.1.3 Estimating the Effect of the Action on Hunting Disturbance in Izembek Lagoon

We expect the proposed road would cause an increase in hunting-caused disturbance. We estimate that the road will lead to a 2.53 to 2.94 increase in the rate of hunting in Izembek Lagoon (see Appendix A). We expect the increase in waterfowl hunting will result in increased waterfowl disturbance and we assume this will occur at a rate proportional to the estimated increase in hunting levels (Table B-3).

Table B-3. Environmental baseline brant disturbance rates and response time due to hunting disturbance in Izembek Lagoon and the condition after the action based on an upper and lower estimate of hunting increases due to the effects of the proposed action. Source: Ward et al. 1994

Hunting Disturbance		**Environmental Baseline**		**Condition After the Action**		
Response Type	Estimate	Events Per Hour	Seconds of Response Per Individual Per Hour	Rate of Increase	Events Per Hour	Seconds of Response Per Individual Per Hour
Flight Response	Lower	0.54	18.27	2.53	1.37	46.22
	Upper	1.35	45.72	2.94	3.97	134.42
Any Response	Lower	0.54	40.50	2.53	1.37	102.47
	Upper	1.35	101.20	2.94	3.97	297.53

B.1.4 Assumptions and limitations

The values represent calculations using the best available data for estimating changes in disturbance for Steller's eiders due to hunting. The reliability of these estimates is limited by several factors:

- We are using data from a 3-year study period in fall 1985 to 1987 (Ward et al. 1994) and we do not know if bird responses to hunting has changed in the following decades.
- We are assuming that bird response is proportional to the activity level at the rates observed from 1985 to 1987, when it may not be. For example, birds may grow habituated to disturbance stimuli and reduce the distance at which they react or otherwise alter the observed disturbance responses. Alternatively, hunting methods may have changed to be more disruptive causing increased bird response.
- We do not know if and how hunting practices may have changed (methodology, intensity, distribution, etc.) to yield a different response from birds since the study occurred.
- We are using Pacific brant as a proxy for Steller's eiders and eider response to disturbance stimuli may differ from brant.
- These data are derived from fall hunting periods and are likely not representative of year-round disturbance events, which we do not have data to calculate.
- When estimating baseline disturbance levels, we estimate an additional threefold increase in harvest based on CUDs data from the past ten years (on top of the threefold increase from band recaptures observed by Leach et al. 2019). This most recent threefold increase does not take into account potential changes in subsistence harvest.

B.2 Boating Disturbance in Izembek Lagoon

The same approach for calculating hunting disturbances, detailed in 2.1 above, can be used for calculating boating disturbances.

B.2.1 Historic Estimates of Boating Disturbance

A disturbance study of Pacific brant from 1985 to 1987 found boats caused an average of 0.02 +/- 0.00 disturbance events per hour within Izembek Lagoon (Ward et al. 1994). When disturbed by boats in the lagoon, an average of 94.4 +/- 2.0 percent of the brant flock had a flight response, with an average flight duration of 172.5 +/- 24.6 seconds. While boating, as well as hunting, did not contribute greatly to the overall interruption time of the study, these activities elicited a consistent and prolonged response from brant, with 77 percent of the flocks leaving the study area in response to boating.

Ward et al. (1994) measured brant disturbance from boating activity separately from disturbance from hunting, even though a portion boating activity was likely related to hunting and providing access. We have no way of knowing what percentage of boating activity was to facilitate hunting; however, we believe it is likely that the majority of boating activity was due to hunting during the fall harvest study period. To provide a conservative, historic estimate, we assume that all boating activity derived from hunting. The study period of 1985 to 1987 occurred during a low period of hunting activity at Izembek Lagoon because hunting was closed for emperor geese and bag limits were lowered from four to two brant. It is estimated that these restrictions resulted in an approximately 60 percent decline in waterfowl hunting activity at Izembek Lagoon during the study period.

Using this data and accounting for 1985 to 1987 having an approximately 60 percent decrease in typical hunting activity, we calculated the following upper and lower estimates of historic disturbance rates from boating during the fall:

► *Disturbance events per hour*
Historic lower estimate: 0.02 disturbance events per hour
Historic upper estimate:

$$(0.02\ disturbance\ per\ hour) \div (40\ percent\ hunting\ volume)$$
$$= (X\ disturbance\ per\ hour) \div (100\ percent\ hunting\ volume)$$

$$X = (0.02 \div 40) \times 100 = 0.05\ disturbance\ events\ per\ hour$$

Using these rates and reported data on 1) the percent of events that elicited a certain response, 2) length of the response, and 3) percent of the flock taking flight, we can calculate an upper and lower estimate of the mean interruption time per hour (both flight and all responses) of brant due to boating disturbances in Izembek Lagoon (Table B-1).

► *Seconds of flight per hour*

$$Disturbance\ events\ per\ hour \times Percent\ yielding\ flight\ response \times Average\ length\ of\ flight \times Percent\ of\ flock\ responding = Seconds\ of\ flight\ response\ per\ hour$$

Historic lower estimate: 2.44 seconds of flight response per hour
Historic upper estimate: 6.11 seconds of flight response per hour

► *Seconds of all disturbance per hour*

$$Disturbance\ events\ per\ hour \times Percent\ yielding\ any\ response \times Average\ length\ of\ responses \times Percent\ of\ flock\ responding = Seconds\ of\ response\ per\ hour$$

Historic lower estimate: 3.71 seconds of response per hour
Historic upper estimate: 9.27 seconds of response per hour

Table B-4. The effect of boating disturbance on brant in Izembek Lagoon from 1985 to 1987. Lower estimates are the levels observed during the 3-year study and upper estimates are calculated based on the study occurring in a year where hunting occurred at 60 percent of typical levels. Source: Ward et al. 1994

Boating Disturbance		**Historic**				
Response Type	Estimate	Disturbance Events Per Hour	Portion of Events Eliciting Flock Response	Average Length of Flock Response (seconds)	Portion of Flock Responding	Seconds of Response Per Individual Per Hour
Flight Response	Lower	0.02	0.75	172.50	0.94	2.44
	Upper	0.05	0.75	172.50	0.94	6.11
Any Response	Lower	0.02	0.89	223.50	0.93	3.71
	Upper	0.05	0.89	223.50	0.93	9.27

B.2.2 Establishing Baseline Boating Disturbance Rates

We do not have a direct way to calculate the potential changes in boat disturbance from all activities that may use boats in Izembek Lagoon. However, it is likely the majority of boating activity during the fall is from hunting. We estimate that hunting has increased ninefold in the decades since the 1985 to 1987 study period. Hunters may gain hunting access to the lagoon on foot or by boat, therefore we estimate half of the hunts were occurring by boat. However, any increase in hunting activity would equally increase the level of use relative to both land-based and boat-based hunting. If there is a ninefold increase in hunting, we anticipate a ninefold increase in boating.

We expect a ninefold increase in boating to result in increased boating-caused disturbance. We assume the disturbance rates will increase at a rate proportional to the increase in boating rate (a ninefold increase). We establish the baseline disturbance rates in Izembek Lagoon by multiplying the disturbance events and the seconds of disturbance per hour by the expected increase in boating (Table B-5).

Table B-5. Historic brant disturbance rates and response time due to boating disturbance in Izembek Lagoon and the calculated environmental baseline values based on a ninefold increase in boating from 1985 to 1987. Source: Ward et al. 1994

Boating Disturbance		**Historic**		**Environmental Baseline**		
Response Type	Estimate	Disturbance Events Per Hour	Seconds of Response Per Individual Per Hour	Rate of Increase	Events Per Hour	Seconds of Response Per Individual Per Hour
Flight Response	Lower	0.02	2.44	9	0.18	21.96
	Upper	0.05	6.11	9	0.45	54.99
Any Response	Lower	0.02	3.71	9	0.18	33.39
	Upper	0.05	9.27	9	0.45	83.43

B.2.3 Estimating the Effect of the Action on Boating Disturbance in Izembek Lagoon

We expect the proposed road to increase boating-caused disturbance with reasonable certainty. We estimate that the road will lead to a 2.53 to 2.94 increase in hunting activity in Izembek Lagoon (see Appendix A). We expect the increase in boat-based waterfowl hunting will result in increased waterfowl disturbance and, consistent with our approach for the baseline, we assume this will occur at a rate proportional to the estimated increase in hunting levels (Table B-6).

Table B-6. Environmental baseline brant disturbance rates and response time due to boating disturbance in Izembek Lagoon and the calculated condition after the action based on an upper and lower estimate of anticipated increases in hunting activity. Source: Ward et al. 1994

Boating Disturbance		Environmental Baseline		Condition After the Action		
Response Type	Estimate	Events Per Hour	Seconds of Response Per Individual Per Hour	Rate of Increase	Events Per Hour	Seconds of Response Per Individual Per Hour
Flight Response	Lower	0.18	21.96	2.53	0.46	55.56
	Upper	0.45	54.99	2.94	1.32	161.67
Any Response	Lower	0.18	33.39	2.53	0.46	84.48
	Upper	0.45	83.43	2.94	1.32	245.28

B.2.4 Assumptions and limitations

The values represent calculations using the best available data for estimating changes in disturbance for Steller's eiders due to boating activities. The reliability of these estimates is limited by several factors:

- We are using data from a 3-year study period in fall 1985 to 1987 (Ward et al. 1994) and we do know if bird response to boating has changed in the following decades.
- We do not know if and how boating practices may have changed to yield a different response from birds since the study occurred.
- We are using Pacific brant as a proxy for Steller's eiders and eider response may differ.
- These data are derived from the fall disturbance surveys and are likely not representative of year-round disturbance events, which we do not have data to calculate.
- We are assuming that bird response is proportional to the activity level at the rates observed from 1985 to 1987, when it may not be. For example, birds may grow habituated to disturbance stimuli and reduce distance at which they react or otherwise alter the observed disturbance responses. Alternatively, boating methods may have changed to be more disruptive, causing increased bird response.
- Underpinning our increased harvest estimate (from which we expect a proportional increase in boat disturbance) is the assumption that 50 percent of current King Cove harvest effort will shift to Izembek Lagoon. It may not be practicable for King Cove hunters to trailer a boat to Izembek Lagoon.
- We assume the existing infrastructure (i.e., boat ramp, trailer storage, etc.) at Grant Point can support the estimated increase in boats use/disturbance.

- We do not have data to measure changes in all types of boating activity in the lagoon since historical levels, so we are using hunting levels as a reasonable proxy. There may be additional changes in boat activity due to other human activities.

B.4 Literature Cited and Data Sources

Cold Bay Outfitters. 2017. Cold Bay Adventures Lodge: Alaska's Premier Waterfowl Hunting & Fishing Lodge. <http://coldbayoutfitters.com/izembek/>. Accessed 2 Apr 2026.

Cornell Lab of Ornithology. 2025. Brant Life History, All About Birds, Cornell Lab of Ornithology. All About Birds. Cornell Lab of Ornithology. <https://www.allaboutbirds.org/guide/Brant/lifehistory>. Accessed 26 Aug 2025.

Leach, A.G., D.H. Ward, J.S. Sedinger, M.S. Lindberg, W.S. Boyd, J.W. Hupp, and R.J. Ritchie. 2017. Declining survival of black brant from subarctic and arctic breeding areas. The Journal of Wildlife Management 81:1210–1218.

Leach, A.G., D.H. Ward, J.S. Sedinger, T.V. Riecke, J.W. Hupp, and R.J. Ritchie. 2019. Spatial Distribution of Band Recoveries of Black Brant. The Journal of Wildlife Management 83:304–311.

Maliguine, A.M. 2024. Changes in benthic prey availability and quality suggest less favorable foraging conditions for threatened Steller's eiders (Polysticta stelleri) molting at Izembek Lagoon, Alaska. Master's Thesis, University of Alaska Fairbanks, Fairbanks, Alaska.

Stillman, R.A., E.M. Rivers, W. Gilkerson, K.A. Wood, B.A. Nolet, P. Clausen, H.M. Wilson, and D.H. Ward. 2021. Predicting impacts of food competition, climate, and disturbance on a long-distance migratory herbivore. Ecosphere 12:e03405.

USFWS. 2019. Status assessment of the Alaska breeding population of Steller's eiders. Northern Alaska Fish and Wildlife Field Office, Fairbanks, Alaska.

Ward, D.H., R.A. Stehn, and D.V. Derksen. 1994. Response of Staging Brant to Disturbance at the Izembek Lagoon, Alaska. Wildlife Society Bulletin 22:220–228.

APPENDIX C

2026 Biological Opinion Change Log

The U.S. Fish and Wildlife Service (Service) issued the Biological Opinion for the Izembek National Wildlife Refuge Land Exchange for a Proposed Road Corridor (Consultation Number 2024-0125485) on October 14, 2025. Subsequent to that date, we observed errors that were not captured during the final editing of the document, and these oversights are addressed in an errata to the biological opinion, dated March 30, 2026. The errors affected how we calculated the amount of current and future disturbance that may occur in Izembek Lagoon, portions of the associated text, and the detailed explanation of calculations found in Appendix A and Appendix B; however, they did not affect our final determinations on whether the proposed action (the Land Exchange between the Service and King Cove Corporation) will result in jeopardy to listed Steller's eiders or northern sea otters and whether it will result in destruction or adverse modification of designated critical habitat.

On March 9, 2026, the Service received the Biological Assessment for the King Cove to Cold Bay Road Project from the U.S. Army Corps of Engineers (USACE) and a request to initiate formal consultation for their proposed issuance of a permit pursuant to section 404 of the Clean Water Act. The Biological Opinion for the USACE King Cove to Cold Bay Project (Consultation Number 2026-0057456) relies on new information available subsequent to the October 14, 2025 consultation with the Service's National Wildlife Refuge System. Changes made from the land exchange biological opinion to the road construction biological opinion reflect these changes and updated analysis in response to the best available information.

Here, we document major changes that have occurred from the Service's Biological Opinion for the Izembek National Wildlife Refuge Land Exchange. Henceforth, the land exchange biological opinion will be referred to as the "2025 BiOp" and the new biological opinion for the road construction as the "2026 BiOp". Changes are documented by the section number in which they occur in the 2026 BiOp.

Document-wide Changes

The following change is reflected throughout the 2026 BiOp:

Population estimates for King Cove and Cold Bay

In the 2025 BiOp, we used the 2024 population estimates for King Cove (866 people) and Cold Bay (56 people) downloaded from the State of Alaska (State of Alaska 2025). However, use of these data was inconsistent with the ANILCA Section 810 Analysis of Subsistence Impacts (USFWS 2025e), the 2025 Land Exchange Agreement, and data presented by USACE and ADOTP&F in their biological assessment (ADOT&PF 2026b). The State published new certified population counts for these communities in January 2026 (State of Alaska 2026a and 2026b). In these updates, the 2025 populations for King Cove and Cold Bay were revised to 383 and 47 people, respectively, with the population reduction coinciding with the closure of the fish processing facility in King Cove. However, construction of a road is anticipated to increase economic, subsistence, and health benefits. We acknowledge that the current population (i.e., environmental baseline condition) of King Cove is currently at a historic low for the past 15 years. However, in this 2026 BiOp we used the 2020 U.S. Census data (King Cove population of 757; Cold Bay population of 50) to calculate human use of the Izembek Complex to be consistent with the data used in the ANILCA Section 810 Analysis of Subsistence Impacts (USFWS 2025e), the 2025 Land Exchange Agreement, and data presented by USACE and ADOTP&F in their biological assessment.

Introduction

Updated with project-specific information.

Analytical Framework

On March 30, 2026, in Center for Biological Diversity v. Burgum, No. 24-cv-04651 (N.D. Cal.), the U.S. District Court for the Northern District of California vacated aspects of four provisions from the 50 CFR part 402 regulations governing interagency consultation under section 7 of the Endangered Species Act and reinstated the provisions that were previously in effect. Consistent with the Court's order, this biological opinion utilizes regulatory provisions set forth by the Court pertaining to: Definition of "Destruction or Adverse Modification" [50 C.F.R. § 402.02], Definition of "Effects of the Action" [50 C.F.R. § 402.02], Mitigation Measures – [50 C.F.R. 402.14(g)(8)], and the Services' Duty to Request Reinitiation of Consultation [50 C.F.R. § 402.16(a)].

Status of the Species & Critical Habitat

3.1.4 Threats
3.1.4.4 Harvest

Minor updates were made to language and descriptions for clarity. We added language to increase alignment with the Biological Opinion for Migratory Bird Subsistence Hunting in Alaska (consultation number 2026-0046815) related to reliability of the Alaska-wide Steller's eider harvest estimates, particularly on the North Slope. We moved Izembek-specific language to environmental baseline.

Environmental Baseline

4.2.1 Fall Molting Period

We added a summary paragraph and table to more clearly convey the number of eiders present in the action area during the fall molt.

4.2.2 Wintering

We added a dataset from 2019 which expanded the time period of our baseline dataset from 5 years to 6 years. This change resulted in a minor change to the average eiders counted in February in Izembek Complex. We also clarified the source of certain data throughout the section.

We added new information from winter 2025/2026 pertaining to the recent, heavy, persistent ice cover in the region and associated bird die offs.

4.2.3 Spring Staging

We added an assumption about how many Alaska-breeding Steller's eiders could be in the action area in spring. The spring survey method is a broad count across Southwest Alaska which allows us to calculate that approximately 50 percent of eiders stage in Izembek relative to the entire Southwest area. This same survey averages 81,543 Steller's eiders from 1992 to 2011 in Southwest Alaska. This presents a logical problem because using the 1 percent rule, we would expect there to be over 800 birds in the Alaska-breeding population. We know the average Alaska-breeding eider population is 406 (average from 2007-2024; SSA). Given that we know 50 percent of birds use Izembek and we have no evidence that Alaska-breeding birds preferentially select Izembek, an alternative logical assumption is that 50 percent of Alaska-breeding birds can use Izembek for staging. While we acknowledge the discrepancy with the 1 percent rule, we lack modern data on the quantity of Russian-breeding Steller's eiders to provide an update. Thus, we still use the 1 percent estimate as an upper estimate of Steller's eider use in Izembek for spring staging.

Note: we considered if this approach was also appropriate to take during the fall molt. We can estimate 9.5 percent of Steller's eiders molting on the Alaska Peninsula use Izembek and therefore considered if assuming 9.5 percent of the Alaska-breeding population uses Izembek is appropriate. We decided it is not appropriate in this case because 1) the survey area of the Alaska Peninsula was smaller than the Southwest Alaska survey area used in the spring survey, 2) Steller's eiders also molt in Kuskokwim Shoals which was excluded from the Alaska Peninsula survey area ,and 3) the small satellite telemetry sample set we have indicates Kuskokwim Shoals may be disproportionately used by Alaska-breeding Steller's eiders.

4.2.4.1 Harvest of Eiders:

In the 2025 BiOp, inadvertent Steller's eider harvest during the subsistence hunt was calculated using data from Naves and Schamber 2024 and pulling annual numbers collected from the Aleutian Pribilof Islands and Bristol Bay Regions. After further review, we are not including the Bristol Bay Region in our 2026 BiOp estimate because it is not part of the project area (see maps below). This results in a decrease in baseline eider harvest in the region due to inadvertent subsistence harvest.

We added extrapolated baseline estimates of inadvertent subsistence and commercial harvest of Steller's eiders within Izembek Lagoon. We did this using the assumption that any inadvertent harvest in Izembek Lagoon occurs in proportion with the Cold Bay community, which has direct access to Izembek Lagoon. See 2026 BiOp text for assumptions. We also added more robust description of why we assume this Izembek specific harvest number is biased low.

4.2.4.2 Sport and Subsistence Hunting of Other Waterfowl Species

We added text pertaining to the spatial reliability of historic disturbance data from Ward et al. 1994. We aimed to improve our conveyance of where these estimates are more and less reliable. To further explain this nuance, we added a figure visualizing the model parameters of Stillman et al. 2021, which builds on Ward et al. 1994 disturbance estimates. We also updated the section to reflect changes in calculations done in Appendix A and Appendix B.

4.2.4.3 Marine Vessel Activity and Fisheries

As in the above section, we added text pertaining to the spatial reliability of historic vessel disturbance data from Ward et al. 1994. We also updated the section to reflect changes in calculations done in Appendix A and Appendix B.

4.2.4.4 Collisions with Vessels

We updated the analysis in this section to clarify our upper and lower estimated collision rate for eiders in the area. We corrected rates that were previously presented as annual rates in the 2025 BiOp to reflect a rate of every three years. We included the atypical year when 150 eiders collided with a marine vessel in our upper estimate because atypical events where numerous birds collide with vessels are known occurrences. This is an improvement in our estimates because bird collisions with vessels have low detectability and when they do occur events often are unreported. By including the atypical year, we have greater confidence we are capturing the full effects of the action. While the analysis changes, ultimately the eider collision risk to ESA-listed eiders remains low.

4.2.4.5 Collisions with Vertical Structures

This is a new section, split out from the 2025 BiOp vessel collision section for added clarity. While the assumptions in the 2025 BiOp remain true (no vertical structures will be added as a result of the installation of a road) we anticipate a small amount of collision risk with construction equipment and lighting due to the low lying, high bird abundance in the region.

We updated our methodology here to match the approach with vessels, including the outlier, large strike events in our upper estimate. The eider collision risk with structures remains very low.

4.4.3.2 Harvest

We updated sea otter harvest numbers from the Service's Marking, Tagging, and Reporting Program (MTRP) to include 2025. Further edits were made in this section and throughout because the MTRP data includes where a sea otter was harvested, not which community the harvester was from.

Effects of the Action

Steller's Eider

Throughout this section, we updated eider presence in the action area to match the summary table added in the environmental baseline.

5.2.1.1 Construction and Road Use

The 2026 BiOp includes a more robust analysis of disturbance from construction due to the additional project details provided. Text and figures were added to support this analysis.

5.2.1.2 Sport and Subsistence Hunting of Waterfowl

We updated the section to reflect changes to calculations in Appendix A and B. We included more robust discussion of where and when these estimates are likely representative.

5.2.1.3 Vessel-based disturbance

We updated the section to reflect changes to calculations in Appendix A and B. We included more robust discussion of where and when these estimates are likely representative.

5.2.1.3 Off-road vehicles

A more robust discussion of expected changes to off-road vehicle use due to the effect of the action was added. This information was added in response to the Addendum to the Biological Assessment received from the applicant May 11, 2026, pertaining to offroad vehicles.

5.2.2 Harvest of Steller's Eiders

Given the changes to Steller's eider harvest in the environmental baseline, we updated calculations for eider harvest as a consequence of the proposed action. Per Appendix A, we estimate that after the road is constructed approximately 50 percent of King Cove may choose to use Izembek Lagoon for hunting activity. Extrapolating from this assumption, we calculate an increase in inadvertent harvest of Steller's eiders. And, assuming inadvertent harvest occurs at equal rates in resident and non-resident hunters, we estimate a total rate of inadvertent eider harvest in Izembek as a result of the proposed action.

5.2.3 Collision Risk

Changes in this section reflect the changes made in the environmental baseline and new conservation measures agreed to by the applicant.

5.2.7 Effects on Recovery

Due to the changes in harvest and collision risk, the estimated mortality due to the effect of the action has increased relative to the 2025 BiOp and errata. It is still below levels that we would expect to have a population level effect.

Northern Sea Otter

5.3.1.1 Construction and Road Use

Updated text to include more analysis on noise for sea otters, based on some additional project information.

5.3.1.2 Vessel-based disturbance

Same as in the above sections, we added text pertaining to the spatial reliability of historic vessel disturbance data from Ward et al. 1994. We also updated the section to reflect changes in calculations done in Appendix A and Appendix B.

5.3.1.3 Hunting-based disturbance and other human Disturbance

We updated the section to reflect changes to calculations in Appendix A and B.

5.3.2 Vessel Strike and Collision Risk

We updated the section to reflect changes to calculations in Appendix A and B.

Cumulative Effects

No major changes.

Conclusion

The 2026 BiOp is a new consultation on a different project for which new information was provided; thus, we draw new conclusions and this section differs substantially from the 2025 BiOp.

Incidental Take Statement

The 2025 incidental take statement was limited to addressing take from the proposed land exchange conveyances and did not address take from the proposed road. Thus, the 2026 BiOp is specific to the proposed action and it addresses take from the proposed road.

Conservation Recommendations

This section was updated because additional project commitments were made by the applicant in response to the 2025 BiOp recommendations and continued coordination with the Service. Due to the scope of the project, in the 2026 BiOp we continue to provide recommendations to improve project outcomes for wildlife.

Appendix A: Quantifying Increased Hunting Rates in Izembek Lagoon Due to the Proposed Action

A.1 Sport Hunting

- We updated the way we calculated changes in sport hunting client use days from the 2025 BiOp/errata. In 2025 we used the CUDs from 2020 as our 3 guide baseline and the CUDS from 2024 as 4 guide and current baseline. Now, we have 2025 CUD data available. In 2025, regulations shortened the hunting season for brant which resulted in a decline in CUDs. Thus, we changed our 4 guide/current baseline to the average of the 5 years with 4 guides – further rationale for why this is an appropriate baseline is supplied in the Appendix. We also changed to use the average of the most recent 5 years with 3 guides.
- The commercially guided sport hunting birds harvested data was not accurately reported in the 2025 BiOp due to an unknown data management error by the Service. These numbers were fixed in Table A-1 and resulted in a slightly lower birds per client use day number for 2016.

A.2 Subsistence harvest

- See the document-wide change regarding community population data. The King Cove and Cold Bay population data used to estimate subsistence harvest were changed to use U.S. Census Bureau data, resulting in a change in calculated numbers.
- We changed the expected portion of King Cove harvest to occur in Izembek Complex to 50 percent in both the upper and lower estimates of changes in harvest. In the 2025 BiOp and errata we used 100 percent of the current community harvest shifting to Izembek

Complex as our upper estimate. The 100 percent upper estimate was always acknowledged as a high estimate and after further assessment in 2026 we deemed it an unlikely upper estimate. For at least the last 30 years, the community of King Cove has harvested approximately 5 pounds of migratory birds per person (ADF&G 1992 and 2016 data). King Cove hunters have existing hunting locations and while some future use of Izembek Lagoon is likely, it is unlikely that 100 percent of harvest would shift to this location given historic hunting success. Our rationale that 100 percent of harvest would not shift to Izembek Lagoon is further supported by communication with the city administrator of King Cove (Gary Hennigh, pers. comm. 2026). However, given the unique, dense aggregation of waterfowl in Izembek Lagoon and testimony during the 2024 ANILCA Section 810 Hearing with King Cove indicating increased subsistence access afforded by the road it is reasonably certain some portion of the community of King Cove could shift to Izembek Lagoon as a result of increased access via the road.

Appendix B: Calculating Increase in Disturbance Due to the Proposed Action

- We found an error in our use of Ward et al. historical data. We incorrectly interpreted that data in Table 4 in Ward considered a disturbance event to be any time the activity (i.e., boating) happened and a bird was disturbed. In actuality, a disturbance event was defined by Ward et al. as any time they observed an activity with a possibility of causing disturbance. Thus, we had considered all disturbance type events to have a 100 percent likelihood of occurring when in actuality they should be lowered by their rate of occurrence in Table 3 of Ward et al. 1994. This brings our calculations in line with Table 5 in Ward et al 1994. We further determined there was value in making these calculations ourselves to get the specific numbers versus using the rounded numbers that Ward et al. presented in their Table 5, which could introduce compounding rounding errors as we extrapolate data into future time periods.
- We maintained the ninefold increase in disturbance expected from historic to present, per the errata to the 2025 BiOp. We provide additional rationale for how we estimate a ninefold increase in disturbance from historic to baseline.
- We changed the rates of expected hunting increase in response to all the changes detailed for Appendix A.
- To establish the environmental baseline for hunting and boating, we used a ninefold increase in disturbance for both disturbance types (in the 2025 BiOP and in the 2026 errata). In the 2026 BiOp, we continue to use this ninefold increase for both boating and hunting with the same assumption that the majority of the vessel-based disturbance during the study period comes from vessel-based hunting. This assumption was also made by Stillman et al. 2021, where they referred to the boating and hunting disturbance as ‘vessel-based hunting’ and ‘land-based hunting’ respectively. In 2025, we took two different approaches to calculating disturbance effects of the road on hunting and boating. After additional consideration, this approach was overly complex and it failed to account for potential increases in vessel traffic due to increased sport hunting, including commercially guided services. Given the baseline approach of assuming the increase in boating will mirror the increase in hunting, in the 2026 BiOp we are changing to using this same approach in the effects of the action section. In other words, we are no longer

attempting to quantify the increase in vessels directly (something we had poor data to achieve) and are instead considering the increase in boating activity to be proportional to the increase in hunting activity. Therefore, we apply the projected 2.53 to 2.94 increase in hunting to our projected changes in boat use in Izembek Lagoon.

United States Department of the Interior

U.S. FISH AND WILDLIFE SERVICE
1011 East Tudor Road
Anchorage, Alaska 99503-6199

July 25, 2025

VIA ELECTRONIC MAIL

Catherine Coon
Assistant Regional Administrator, Habitat Conservation
National Marine Fisheries Service
P.O. Box 21668
Juneau, AK 99802-1668

RE: Response to Recommended Essential Fish Habitat Conservation Measures for the 2025 Proposed Izembek Land Exchange and Road Corridor

Dear Ms. Coon:

Thank you for your letter dated July 10, 2025, regarding the Izembek Land Exchange and Road Corridor; NMFS ECO Reference No. AKRO-2025-01915. Below please find our written response to your five recommended conservation measures as required pursuant to Section 305(b)(4)(B) of the Magnuson-Stevens Fishery Conservation and Management Act (MSA). Our responses, developed in coordination with the King Cove Corporation (KCC) as the land exchange entity and the State of Alaska Department of Transportation and Public Facilities (AKDOT&PF) as the anticipated road project applicant, are provided directly below the National Marine Fisheries Service's (NMFS's) recommended conservation measures. Where our response is inconsistent with NMFS's recommendations, we have explained the reasons and/or justification for the modified measures.

1. Culverts should meet or exceed natural stream width and should be designed and installed according to the guidelines established in *Culvert Design Guidelines for Ecological Function*, which was written specifically for Alaska salmonids (Hanson 2022).

   ***Response**: The Service and KCC have already agreed to this as part of the proposed design criteria (see Sections 2.4 and 5.0 of the Draft EFH Assessment). Please note that this design criteria applies to culverts in anadromous streams.*

2. Conduct stream surveys within the project footprint to identify the number of anadromous stream crossings required for completion of the project. Given the remote project footprint, the volume of anadromous habitat within the project footprint has likely not been fully surveyed. There are potentially numerous anadromous water bodies within the footprint which have not been added to the Anadromous Waters Catalog.

   ***Response**: The Service and KCC support the following: The DOT&PF is in the process of obtaining special use permits to conduct environmental surveys, including a fish habitat survey on select streams. Due to logistical constraints related to accessing the wilderness area, a full survey of every wadable stream for fish habitat is not feasible. Given these access constraints, the DOT&PF can commit to conducting a desktop survey of potential fish habitat within the Izembek Refuge in support of the KCC proposed land exchange and road corridor. This survey will be informed by existing LiDAR and* *topographic data obtained within the Refuge in addition to the results of the limited fish inventories and habitat surveys that are proposed to be conducted within the wilderness area.*

3. Install structures to prevent the formation of ATV trails through anadromous streams within the footprint of the proposed project.

   Response: *The Service and KCC support the following: The DOT&PF does not believe that engineering controls/structures installed at anadromous streams along the road corridor (e.g., short spans of guardrail) would be successful in deterring would-be lawbreakers from accessing the stream. Individuals that desire to unlawfully access the stream will simply begin their traversal of the road embankment to the stream wherever the structure begins/ends. Further, installing guardrail is considered a hazard within the roadway; particularly where it isn't warranted for safety. Finally, installing guardrail would require widening the roadway embankment to achieve the same lane widths, thereby increasing the impact to anadromous habitat from construction. The DOT&PF recommends – and can commit to – the installation of signage that informs the public of the law prohibiting vehicular access to anadromous streams. Below is an example found at Sheep Creek in Juneau. The DOT&PF would recommend that any signage specifically cites Alaska Statute 41.14.870, 5 Alaska Administrative Code 195.010(a), and any federal regulations relating to vehicular access to fish streams.*

4. Natural vegetation along anadromous streams should be retained to the greatest extent practicable, and placement of fill within anadromous streams should be avoided.

Response: *The Service and KCC support the following:*

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- *Retain natural vegetation along anadromous streams: The DOT&PF is committed to the successful revegetation of streambanks within anadromous waters. On other DOT&PF projects in the Cold Bay area, specifications have been developed to require contractors to salvage the vegetated mat along streambanks prior to ground disturbance. This vegetated mat would be maintained (usually via periodic watering) until the revegetation stage and staked in place for reestablishment. In addition, further mitigation of impacts such as willow staking and the placement of large woody debris can be analyzed for employment at these locations.*
- *Avoid placement of fill within anadromous streams: The DOT&PF recognizes the need to avoid fill – especially riprap – within anadromous streams. It should be noted that this desire must be subordinated to sound engineering. It is often necessary to utilize riprap at the inlets/outlets of drainage structures to prevent erosion, damage to the structure, and further degradation of fish habitat. The DOT&PF is committed to limiting the deployment of riprap in anadromous streams by only installing riprap where it is required for protection of infrastructure.*

5. Bridge abutments in anadromous waters should be positioned so as not to restrict the flow and create a velocity barrier to migrating fish at the crossing site.

> ***Response:*** *The Service and KCC support the following: The DOT&PF is willing to commit to this measure.*

Thank you for your time in consultation on EFH as it relates to this project and for suggesting conservation measures to avoid or minimize the potential for direct and indirect project related impacts. Please reach out with any other considerations and we look forward to continuing to work with you.

Sincerely,

Bobbie Jo Skibo

Bobbie Jo Skibo
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UNITED STATES DEPARTMENT OF COMMERCE
National Oceanic and Atmospheric Administration
National Marine Fisheries Service
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Juneau, AK 99802-1668

August 7, 2025

Bobbie Jo Skibo
U.S. Fish and Wildlife Service
Alaska Energy and Access Program
1011 East Tudor Road
Anchorage, AK 99503

Re: Izembek Land Exchange and Road Corridor Letter of Concurrence, AKRO-2025-01895

Dear Ms. Skibo:

The National Marine Fisheries Service (NMFS) has completed informal consultation under section 7(a)(2) of the Endangered Species Act (ESA) and its implementing regulations (50 C.F.R. 402.13) regarding the proposed authorization for the Izembek land exchange and road corridor located in King Cove, Alaska (Figure 1). The U.S. Fish and Wildlife Service (USFWS) requested written concurrence that the proposed action may affect, but is not likely to adversely affect, the endangered blue whale (*Balaenoptera musculus*), endangered fin whale (*Balaenoptera physalus*), endangered Western North Pacific, Central America, or threatened Mexico distinct population segment (DPS) humpback whale (*Megaptera novaeangliae*) or their critical habitats, endangered North Pacific right whale (*Eubalaena japonica*) or its critical habitat, endangered sperm whale (*Physeter macrocephalus*), endangered Western North Pacific DPS gray whale (*Eschrichtius robustus*), endangered sei whale (*Balaenoptera borealis*), endangered Eastern North Pacific Southern Resident killer whale (*Orcinus orca*) or its critical habitat, endangered Cook Inlet beluga whale (*Delphinapterus leucas*) or its critical habitat, or endangered Western DPS Steller sea lion (*Eumetopias jubatus*) or its critical habitat. In addition, the action agency requested a discretionary conference on the sunflower sea star (88 FR 16212, March 16, 2023) in the consultation and requested concurrence with a may affect, but not likely to adversely affect determination. Based on our analysis of the information you provided to us, and additional literature cited below, NMFS concurs with your determination.

Updates to the regulations governing interagency consultation (50 CFR part 402) were effective on May 6, 2024 (89 FR 24268). We are applying the updated regulations to this consultation. The 2024 regulatory changes, like those from 2019, were intended to improve and clarify the consultation process, and, with one exception from 2024 (offsetting reasonable and prudent measures), were not intended to result in changes to NMFS' existing practice in implementing section 7(a)(2) of the ESA (84 FR at 45015; 89 FR at 24268). We have considered the prior rules and affirm that the substantive analysis and conclusions articulated in this letter of concurrence would not have been any different under the 2019 regulations or pre-2019 regulations.

This letter underwent pre-dissemination review in compliance with applicable Data Quality Act guidelines. A complete administrative record of this consultation is on file in NMFS Alaska Regional office.

Consultation History

NMFS received your request for consultation on July 1, 2025. NMFS requested more information about the project via email on July 7 and 9, 2025. On July 18, 2025, USFWS provided NMFS with additional information regarding the proposed mitigation measures. NMFS initiated informal consultation on July 18, 2025. NMFS and USFWS met to discuss the scope of the proposed action and USFWS provided an update to NMFS via email on July 28, 2025 with modifications the originally proposed action.

Description of the Proposed Action

"Action" means all activities or programs of any kind authorized, funded, or carried out, in whole or in part, by Federal agencies in the United States or upon the high seas. 50 CFR 402.02.

Land Exchange

USFWS proposes to authorize an exchange of public (U.S. government owned and administered by USFWS) and privately owned (King Cove Corporation (KCC)) land, which would provide a land corridor for allowing construction and operation of a year-round road between the City of King Cove and the all-weather airport in Cold Bay, located on the Alaskan Peninsula. The King Cove Group, representing the City of King Cove, Aleutians East Borough, KCC, the Agdaagux Tribe, and the Native Village of Belkofski, is interested in moving forward with the 2025 Proposed Land Exchange Agreement, a document modelled off the 2019 Land Exchange Agreement, which proposes the following:

- Convey approximately 490 acres of public lands from Federal ownership to private ownership by KCC
    - The land, including surface and subsurface estates, is owned by the U.S. government and administered by USFWS as part of Izembek National Wildlife Refuge (NWR) and Izembek Wilderness, and is composed of 484 acres of Izembek NWR land and six acres of subsurface estate owned by the U.S. government
- Convey the surface estate of certain KCC lands in Izembek NWR to USFWS
    - The land to be conveyed will be selected from the KCC Exchange Lands Pool (Figure 1), made up of 1,739 legal acres
- Relinquish KCC's selection rights (under the Alaska Native Claims Settlement Act of 1971 (ANCSA)) to 5,430 acres located within Izembek NWR on the east side of Cold Bay (see KCC Relinquished Selected Lands, Figure 1)
    - KCC will be entitled to conveyance of 5,430 acres of previously selected land from outside Izembek NWR, under ANCSA

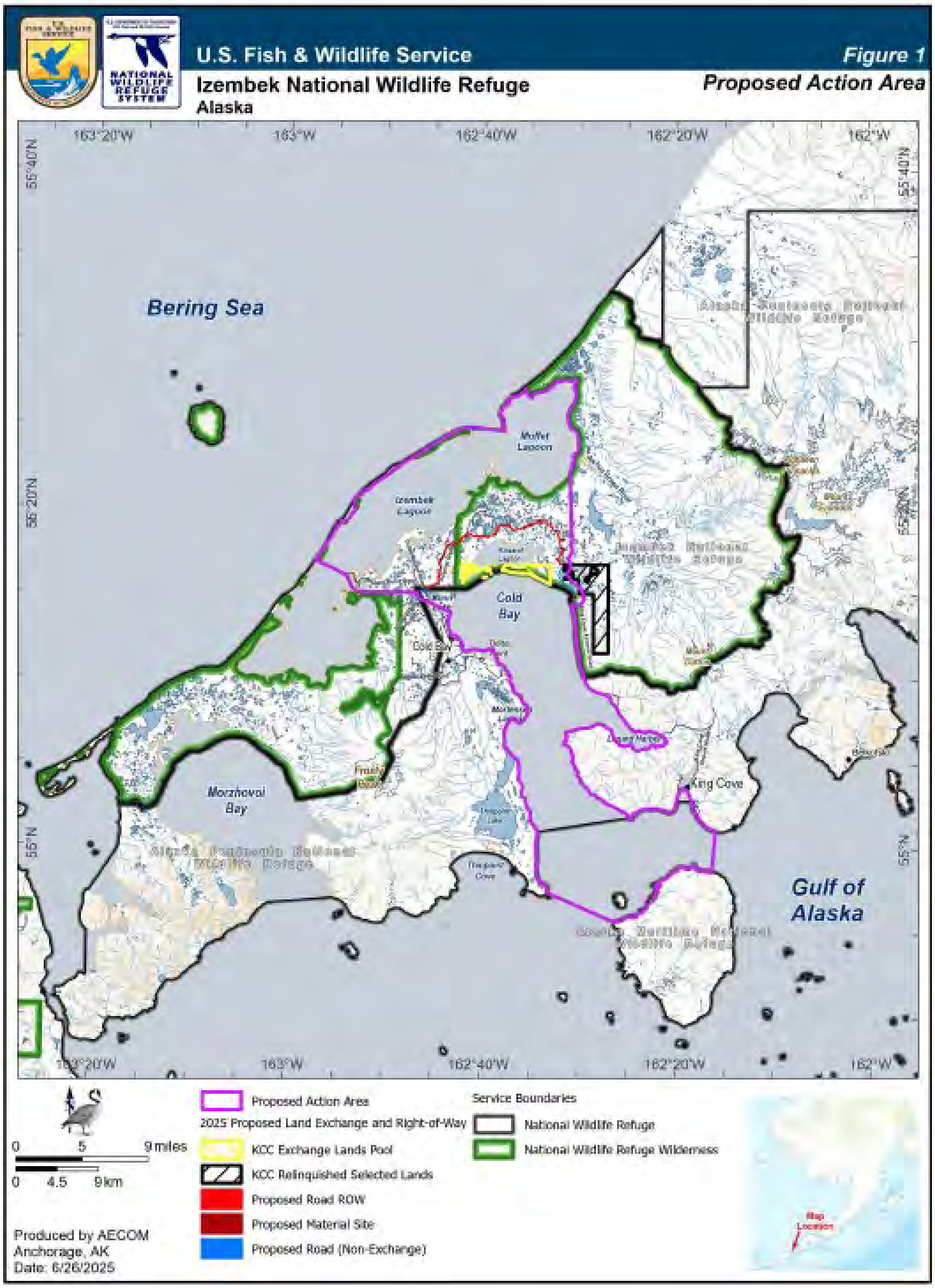

Figure 1. Map of proposed action area for the land exchange and road corridor.

<u>Barging of Construction Supplies</u>

If the proposed land exchange is authorized, road construction supplies will need to be imported to King Cove and Cold Bay. It is expected that construction will take two years and up to 10 barge deliveries will occur per construction season (40 total trips over two seasons). Barges transporting construction materials would come from, stop at, or return to a number of port locations, including: Seattle, WA; Seward, Anchorage, Kodiak, and/or Dutch Harbor, AK. The hovercraft ramps that already exist at the Northeast Terminal and Cross Wind Cove will serve as landing sites for the barges.

Additional Activities

If the proposed land exchange is authorized, the following actions may also occur, but will require more specific designs and various permits from the U.S. Army Corps of Engineers, Alaska Department of Transportation and Public Facilities, and other relevant parties. These permits may require additional ESA section 7 consultations with NMFS. The current consultation only covers the land exchange and the barge traffic that will overlap with ESA-listed species and their critical habitat. Below, we describe potential actions that could take place if the land exchange is authorized, as outlined in the proposed project description provided by USFWS.

Proposed Road Corridor and Design

The land exchange would allow for a road to be constructed following the route refined in ADOT&PF (2021). The road corridor would start near the Northeast Terminal at the end of the King Cove Access Road (Figure 2) and extend north for approximately 2.8 miles before crossing into Izembek Wilderness lands. The corridor would continue north for approximately 3.5 miles, then extend west for approximately seven miles before turning southwest for approximately 5.1 miles before exiting the Izembek NWR, terminating in 0.5 miles at the intersection of Outer Marker Road and Blinn Lake Loop (Figure 2).

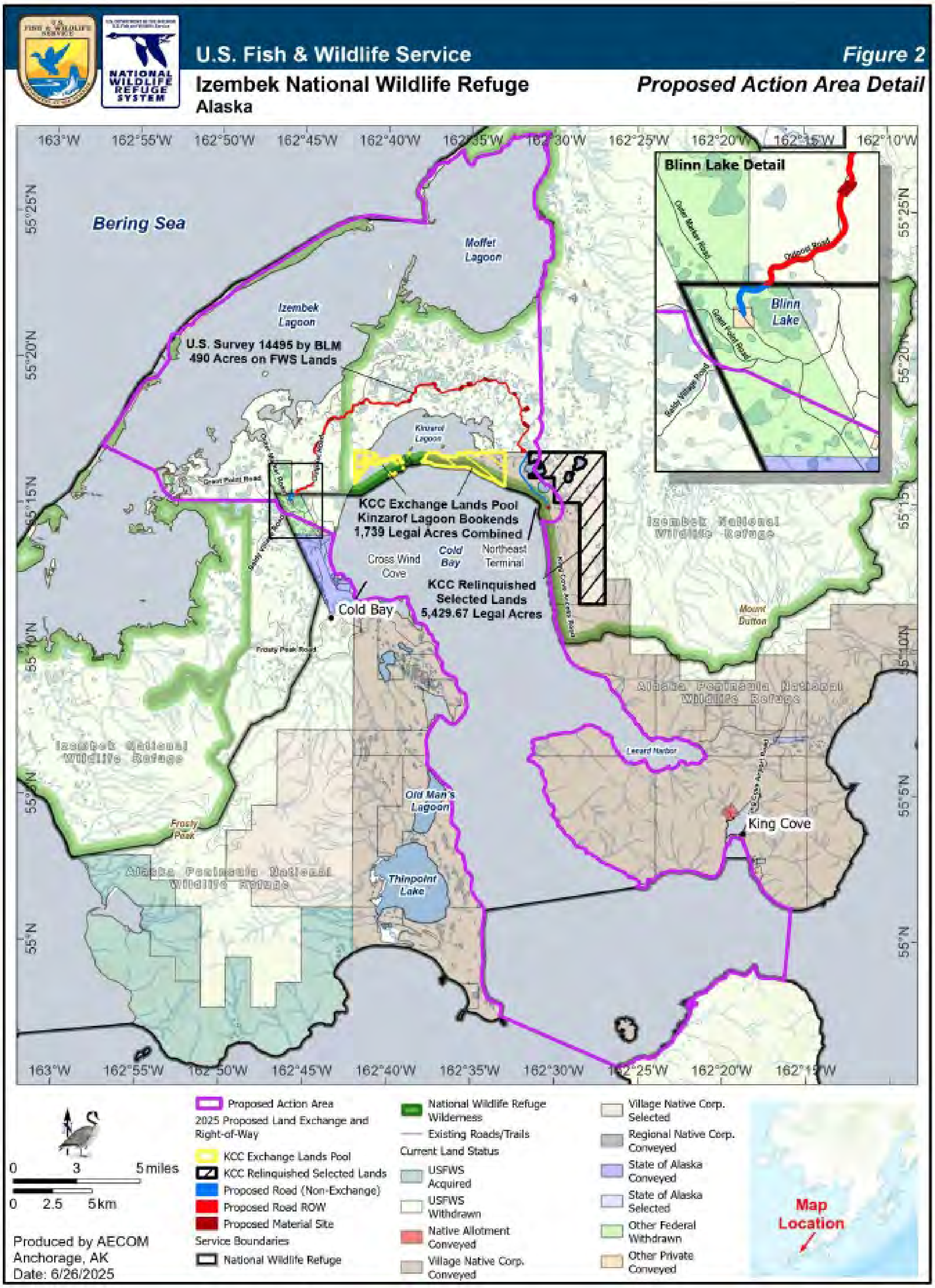

Figure 2. Detailed action and surrounding areas, including markers for the road corridor (USFWS 2025).

The road will be designed based on the American Association of State Highway and Transportation Officials Policy on Geometric Design of Highways and Streets and Guidelines for Geometric Design of Very Low Volume Roads (AAAHTO 2019), and the ADOT &PF Alaska Highway Pre-Construction Manual (ADOT&PF 2005). Surveys and geotechnical investigations have not yet been conducted, nor has permitting occurred based on a detailed design. However, the proposed road considered for this consultation would be a 11 ft wide single-lane road with 1 ft shoulders on each side (total width of 13 ft). Approximately 113 turnouts would be constructed along the road to allow safe passage of vehicles. Materials for the roadway would be extracted from material sites along the roadway. The total estimated footprint of the road construction activities would be 186 acres.

Support structures expected to be built for the road include one bridge over Southeast Kinzarof Stream (near mile point 2.6), seven culverts, pipe arches, or small bridges to cross smaller streams, and 63 cross drainage culverts to maintain natural drainage patterns. Installation of the bridge over Southeast Kinzarof Stream would require pile driving.

Construction

If the land exchange is authorized, construction could to take place between May and November, over two construction seasons (years to-be-determined). This work would be subject to the necessary future permits and associated consultations.

Materials for road construction would come from excavation of 13 competent material sites and sourced from two dedicated materials sites, one existing near the Northeast Terminal on KCC lands and one to be developed near mile point 4.9 (Figure 2). Approximately 1.7 million cubic yards of material would be moved during construction activities, including 521,000 cubic yards of crushed rock for road construction and another 10,000 cubic yards to be processed and stockpiled for road maintenance. The current material site near the Northeast Terminal would supply 200,00 cubic yards of fill, with a six-acre impact area on KCC and federally owned lands. Any soils disturbed during construction would be stockpiled and used for grading and reclamation.

Additional construction components include watering of the road for embankment compaction and dust control (expected to come from nearby freshwater lakes), and staging of contractor trailers and personnel housing at the Northeast Terminal, Lenard Harbor, the City of King Cove, and/or the City of Cold Bay. These activities will not impact ESA-listed or proposed species.

<u>Action Area</u>

"Action area" means all areas to be affected directly or indirectly by the Federal action and not merely the immediate area involved in the action (50 CFR 402.02). For this reason, the action area is typically larger than the project area and extends out to a point where no measurable effects from the proposed action occur.

NMFS defines the action area for this project as the area within the proposed land exchange (7,169 acres total between KCC Exchange Lands and KCC relinquished lands), as well as the Kinzarof and Izembek Lagoons and the Izembek isthmus between them, the marine waters of Cold Bay from Kinzarof Lagoon south to Deer Islands (Figure 2), and the to-be-determined marine vessel transit routes, which may include any of the following ports: Seattle, WA; Seward, Anchorage, Kodiak, and/or Dutch Harbor, AK..

Mitigation Measures

The proposed action will include the following mitigation measures.

As this consultation pertains to the authorization of the land exchange and barging of construction materials, it does not include complete design details and mitigation measures for actual road construction activities. These activities, once finalized, may undergo additional consultations, which will contain more specific and inclusive mitigation measures. Those included here cover barge transport, which is certain to occur if the land exchange is authorized.

For all reporting that results from implementation of these mitigation measures, NMFS will be contacted using the contact information specified in (Table 1). In all cases, notification will reference the NMFS consultation tracking number (e.g., AKRO-2025-01895).

<u>Project-Dedicated Vessels (vessel and crew safety should never be compromised)</u>

1. Project-specific barges will typically travel at 8 knots or less.

2. Vessel operators will:

    a. maintain a watch for marine mammals at all times while underway;

    b. avoid changes in direction and speed within 274 meters (300 yards) of a whale, unless doing so is necessary for maritime safety;

    c. not position vessel(s) in the path of a whale, and will not cut in front of a whale in a way or at a distance that causes the whale to change direction of travel or behavior (including breathing/surfacing pattern);

    d. check the waters immediately adjacent to the vessel(s) to ensure that no whales will be injured when the propellers are engaged;

    e. reduce vessel speed to less than 8 knots when:

        i. weather conditions reduce visibility to 1.6 kilometers (1 mile) or less;

        ii. a whale's course and speed are such that it will likely cross in front of a vessel that is underway, or approach within 91 meters (100 yards) of the vessel, and if maritime conditions safely allow, the engine will be put in neutral and the whale will be allowed to pass beyond the vessel, except that vessels will remain 460 meters (500 yards) from North Pacific right whales;

    f. take reasonable steps to alert other vessels in the vicinity of the whale(s);

g. not allow lines to remain in the water unless both ends are under tension and affixed to vessels or gear; and

h. not throw trash or other debris overboard, to reduce the potential for marine mammal entanglement.

3. Vessel operators will adhere to the Alaska Humpback Whale Approach Regulations when vessels are transiting to and from the project site: (see 50 CFR 216.18, 223.214, and 224.103(b); these regulations apply to all humpback whales). Specifically, pilot and crew will not:

   a. approach, by any means, including by interception (i.e., placing a vessel in the path of an oncoming humpback whale), within 100 yards of any humpback whale;

   b. cause a vessel or other object to approach within 100 yards of any humpback whale; or

   c. disrupt the normal behavior or prior activity of a humpback whale by any other act or omission.

<u>Vessel Transit, North Pacific Right Whales, and their Designated Critical Habitat</u>

4. Vessels will:

   a. remain at least 460 meters (500 yards) from North Pacific right whales; and

   b. avoid traveling through designated North Pacific right whale critical habitat if practicable (50 CFR 226.215); or if traveling through North Pacific right whale critical habitat cannot be avoided, vessels will:

      i. travel through North Pacific right whale critical habitat at 5 knots or less; and

      ii. maintain a log indicating the time and geographic coordinates at which vessels enter and exit North Pacific right whale critical habitat.

<u>Vessel Transit, Western DPS Steller Sea Lions, and their Designated Critical Habitat</u>

5. Vessels will not approach within 5.5 kilometers (3 nautical miles) of rookery sites listed in 50 CFR 224.103(d).

6. Vessels will not approach within 914 meters (3,000 feet) of any Steller sea lion haulout or rookery.

<u>Vessel Transit and Project Noise, Cook Inlet Beluga Whales, and their Designated Critical Habitat</u>

7. Project vessel(s) operating in or transiting through Cook Inlet will maintain a distance of at least 1.5 miles south of the mean lower low water line.

Observers and Reporting

8. To the greatest extent practicable, dedicated project barges that are under contractor control during construction will maintain a watch for marine mammals while underway.

9. Marine mammal information collected will be shared with NMFS.

Table 1. Summary of Agency Contact Information.

Reason for Contact	**Contact Information**
Consultation Questions & Unauthorized Take	akr.prd.section7@noaa.gov
Reports & Data Submittal	akr.prd.records@noaa.gov
Stranded, Injured, or Dead Marine Mammals	Stranding Hotline (24/7 coverage) 1-877-925-7773
Oil Spill & Hazardous Materials Response	U.S. Coast Guard National Response Center: 1-800-424-8802 and AKRNMFSSpillResponse@noaa.gov
Illegal Activities *(not related to project activities; e.g., feeding, unauthorized harassment, or disturbance to marine mammals)*	NMFS Office of Law Enforcement (AK Hotline): 1-800-853-1964
In the event that this contact information becomes obsolete	NMFS Anchorage Main Office: 907-271-5006 or NMFS Juneau Main Office: 901-206-4342

Listed Species and Critical Habitat

Blue Whale

The blue whale (*Balaenoptera musculus*) was listed as an endangered species under the ESCA in 1970 (35 FR 8491, June 2, 1970 (baleen whales listing); 35 FR 18319, December 2, 1970 (blue whale listing)), and continued to be listed as endangered following the passage of the ESA. Although blue whales have been divided into stocks for management purposes under the MMPA, distinct population segments have not been adopted under the ESA. Blue whales from both the Northeast Pacific and Central/Western Pacific populations are found in Alaska (Rice et al. 2020). A recovery plan was published in 1998 (NMFS 1998) but critical habitat has not been designated. Ship strike and entanglement with commercial fishing gear are two current sources of mortality (Carretta et al. 2020).

Blue whales were significantly depleted by commercial whaling activities worldwide. Between 1905 and 1971 an estimated 3,411 blue whales were removed from the eastern North Pacific by commercial whaling (Monnahan et al. 2014). An analysis of line-transect survey data from 1996-2014 provided a range of blue whale estimates from a high of approximately 2,900 whales in 1996 to a low of 900 whales in 2008 (Barlow 2016). Photographic mark-recapture estimates of abundance from 2005 to 2011 range from 1,000 to 2,300 whales (Calambokidis and Barlow 2013). The most recent abundance estimate for blue whales in the eastern North Pacific is 1,898 whales, based on the Chao model and the most recent data from 2015-2018 (Calambokidis and Barlow 2020).

The U.S. West Coast is an important feeding area in summer and fall for blue whales from the Eastern North Pacific stock, and they are increasingly found feeding north and south of this area in summer and fall. Most of this stock is believed to migrate south to spend the winter and spring in high productivity areas off Baja California, the Gulf of California, and on the Costa Rica Dome. Blue whales from the Central North Pacific stock feed southwest of Kamchatka, south of the Aleutians, and in the Gulf of Alaska during the summer, and migrate to lower latitudes in the western and central Pacific, including Hawaii in the winter (Carretta et al. 2020).

Blue whales make low frequency calls between 10 and 40 Hz lasting between ten and thirty seconds. NMFS categorizes blue whales in the low-frequency cetacean functional hearing group, with an applied frequency range between 7 Hz and 36+ kHz (NMFS 2024).

More information on blue whale biology and habitat is available at:

Blue Whale Species Description

Marine Mammal Stock Assessment Reports: Cetaceans-Large Whales

2020 Status Review

Blue whales in the action area

Blue whale individuals are a deep water species (Matsuoka et al. 2013; Rone et al. 2017) and are not expected to be impacted by work in the action area near Cold Bay and King Cove. However, blue whales have been detected acoustically in the Gulf of Alaska between southeast Alaska and Kodiak Island, so they may overlap with project barges transiting through the Gulf of Alaska, particularly if barges are coming from Seattle, WA.

Fin Whale

The fin whale (*Balaenoptera physalus*) was decimated by commercial whaling in the 1800s and early 1900s. It was listed as an endangered species under the ESCA in 1970 (35 FR 8491, June 2, 1970 (baleen whales listing); 35 FR 18319, December 2, 1970 (fin whale listing), and continues to be listed as endangered following passage of the ESA. Critical habitat has not been designated for fin whales. There are no reliable estimates of current and historical abundances for fin whales, and there continue to be uncertainties in their population structure (Muto et al. 2022). Based on dedicated line-transect surveys of the offshore waters of the Gulf of Alaska conducted by Rone et al. (2017), the best provisional abundance estimate in the northeast Pacific is 3,168 fin whales. However, this is an underestimate because these surveys covered only a small portion of fin whale range, and no correction factors were computed for this data (Muto et al. 2022).

Fin whales occur throughout the North Pacific, from the northeastern Chuckchi Sea to the Tropic of Cancer. They occur mostly offshore but frequently enter exposed coastal areas. It has been presumed that fin whales undergo regular long-range migrations between high latitude summer feeding grounds and lower-latitude winter calving grounds like other baleen whales. However, there is evidence that fin whales exhibit more complex and varied movement patterns, and do not perform concerted seasonal long-term migrations (Mizroch et al. 2009). Their winter distribution and location of primary calving areas (if any) are not well understood (Young et al. 2023). In any one season, fin whales can occur at many different latitudes, possibly depending on their age or reproductive state; movements can be inshore/offshore or north/south (NMFS 2010a). Fin whales also exhibit residency patterns in some parts of their range (i.e., the Gulf of California and East China Sea) (Mizroch et al. 2009). Fin whales remain in Alaskan waters through the winter (Moore et al. 2006; Mizroch et al. 2009; Rice et al. 2021), and there is recent evidence for both feeding and reproductive behavior in high latitudes during winter (Koot 2015). However, it is not clear whether the fin whales that occur in northern latitudes in the winter represent year-round resident individuals, or if staggered migration patterns occur that result in at least some whales being present at all times.

Fin whale distribution is primarily driven by prey availability, which includes schooling fish, euphausiids, and copepods. Fin whale concentrations in the northern North Pacific and Bering Sea generally form along frontal boundaries, which are highly productive mixing zones between coastal and oceanic waters. These nutrient rich waters can sustain high biomasses of phytoplankton and zooplankton and correspond roughly to the continental shelf edge (NMFS 2010a). Fin whales in the Gulf of Alaska are found consistently along the shelf break; passive acoustic monitoring studies recorded fin whales at more sites on or near the continental shelf compared to seamount sites in deeper water (Rice et al. 2021). Historical whaling data provide further evidence that fin whales are strongly associated with the shelf edge; habitat models based on catch data identified the continental slope as essential habitat for fin whales (Gregr and Trites 2001).

Fin whales produce a variety of low-frequency sounds, with their primary call types centered around 20 Hz and 40 Hz. These are highly stereotyped, frequency down-swept, loud (as high as 189 dB re 1 µPa at 1 m), and short duration (~1 second) (Watkins 1981; Wiggins and Hildebrand 2020). The 20 Hz note is the most commonly reported fin whale sound. Males produce 20 Hz pulses in repetitive doublet or triplet sequences (song); singing is only exhibited by males and is considered a reproductive display (Croll et al. 2002). The note pattern (i.e., singlets or doublets), internote interval, and sometimes frequency of the songs varies geographically among regions (Watkins et al. 1987; Hatch and Clark 2004). This geographic variation may reflect population structure. The 40-Hz call is not well understood, but evidence suggests it is associated with feeding behavior and may serve a foraging function (Watkins 1981; Širović et al. 2013).

While there is no direct data on hearing in low-frequency cetaceans, the applied frequency range is expected to be between 7 Hz and 36+ kHz (NMFS 2024). Estimates based on scans of a fin whale calf skull indicate the range of best hearing for fin whale calves to range from approximately 20 Hz to 10 kHz, with maximum sensitivities between 1 to 2 kHz (Cranford and Krysl 2015).

Additional information on fin whale biology and habitat is available at:

Fin Whale Species Description

Marine Mammal Stock Assessment Reports: Cetaceans-Large Whales

2019 Status Review

Fin whales in the action area

Fin whales are typically found in deep water (Matsuoka et al. 2013; Rone et al. 2017) away from the immediate coast (Clarke et al. 2020); consequently it is unlikely that they would overlap with effects from project activities in the areas around Cold Bay and King Cove. However, project barges will transit through waters occupied by fin whales.

Humpback Whale

The humpback whale (*Megaptera novaeangliae*) was listed as endangered under the ESCA in 1970 (35 FR 8491, June 2, 1970 (baleen whales listing); 35 FR 18319, December 2, 1970 (humpback whale listing)). Congress replaced the ESCA with the ESA in 1973, and humpback whales continued to be listed as endangered. NMFS conducted a global status review that led to changing the status of humpback whales under the ESA and dividing the species into 14 distinct population segments (DPS) (81 FR 62260, September 8, 2016). Of these 14 DPSs, NMFS listed four as endangered, one as threatened, and delisted the remaining nine. Three DPSs occur in waters of Alaska, and another of the coast of Washington. The Western North Pacific (WNP) and Central America DPSs are listed as endangered; the Mexico DPS is listed as threatened; and the Hawaii DPS is not listed (81 FR 62260, September 8, 2016).

The Hawaii DPS population is estimated to be 11,540 animals (CV=0.04) with an annual growth rate between 5.5 and 6.0 percent. The Mexico DPS is comprised of approximately 2,913 animals (CV=0.7; Wade 2021) with an unknown, but unlikely to be declining, population trend (81 FR 62260, 62286, 62305; September 8, 2016). Approximately 1,084 animals (CV=0.09) comprise the WNP DPS (Wade 2021). Humpback whales in the Western North Pacific remain rare in some parts of their former range, such as the coastal waters of Korea, and have shown little sign of recovery in those locations. The Central America DPS has an estimated abundance of 1,496 animals (CV=0.171).

Whales from the three listed DPSs overlap on feeding grounds off Alaska, or off the coast of Washington (Central American DPS), and are visually indistinguishable unless individuals have been photo-identified on breeding grounds and again on feeding grounds. All waters off the coast of Alaska and Washington may contain ESA-listed humpbacks.

Humpback whales produce a variety of vocalizations ranging from 20 Hz to 10 kHz (Silber 1986; Richardson et al. 1995; Au 2000; Erbe 2002; Au et al. 2006; Vu et al. 2012). NMFS categorizes humpback whales in the low-frequency cetacean functional hearing group, with an applied frequency range between 7 Hz and 36+ kHz (NMFS 2024).

Aleutian Islands and Bering Sea

The abundance estimate for humpback whales in the Bering Sea and Aleutian Islands is estimated to be 7,758 (CV= 0.2) animals, which includes whales from the unlisted Hawaii DPS (91 percent), threatened Mexico DPS (7 percent), and endangered WNP DPS (2 percent; NMFS 2021; Wade 2021)(Table 3). These same DPS proportions apply for the Chukchi and Beaufort seas. Humpback whales have increasingly been recorded during surveys in the eastern Chukchi Sea (67°–72°N, 157°–169°W) from July to October primarily over the continental shelf (Brower et al. 2018). During similar aerial surveys in 1982–1991, there was a complete lack of sightings of these whales (Brower et al. 2018). It is unknown if this is an indicator of population recovery, climate change, or increased survey effort (Brower et al. 2018).

The area around the Aleutian Islands from Umnak Island northeastward along the Alaska Peninsula has been identified as a Biologically Important Area for humpback whales (Brower et al. 2022). Telemetry data from Kennedy et al. (2014) supported findings of historical data showing that humpback whales congregate in the shallow, highly productive coastal waters north of the eastern Aleutian Islands, between Unimak and Samalga Passes. The extremely high proportion of foraging within the narrow band 200 km east and west of Unalaska Bay further emphasizes the importance of the waters off the eastern Aleutian Islands for humpback whales (Kennedy et al. 2014). Annual vessel-based, photo-identification surveys in the Shumagin Islands from 1999 to 2015 identified 654 unique individual humpback whales between June and September (Witteveen and Wynne 2017).

Gulf of Alaska

The abundance estimate for humpback whales in the Gulf of Alaska is 2,129 (CV=0.08) animals, which includes whales from the unlisted Hawaii DPS (89 percent), threatened Mexico DPS (11 percent), and endangered Western North Pacific DPS (1 percent; Wade 2021) (Table 3). Humpback whales occur throughout the central and western Gulf of Alaska from Prince William Sound to the Shumagin Islands. Seasonal concentrations are found in coastal waters of Prince William Sound, Barren Islands, Kodiak Archipelago, Shumagin Islands, and south of the Alaska Peninsula. Large numbers of humpbacks have also been reported in waters over the continental shelf, extending up to 100 nm offshore in the western Gulf of Alaska (Rone et al. 2017; Wade 2021).

Humpback Whale Critical Habitat

Critical habitat for the WNP, Mexico, and Central America DPSs of humpback whales was designated effective May 21, 2021 (86 FR 21082, April 21, 2021; Figure 3). Critical habitat for the WNP and Mexico DPSs includes areas in the eastern Aleutian Islands, the Shumagin Islands, and around Kodiak Island, and critical habitat for the Central America DPS includes the Strait of Juan de Fuca (50 CFR 226.227) (Figure 3).

For the WNP DPS, the physical and biological features associated with critical habitat include: prey species, primarily euphausiids (*Thysanoessa* and *Euphuasia*) and small pelagic schooling fishes, such as Pacific herring (*Clupea pallasii*), capelin (*Mallotus villosus*), juvenile walleye pollock (*Gadus chalcogrammus*), and Pacific sand lance (*Ammodytes personatus*) of sufficient quality, abundance, and accessibility within humpback whale feeding areas to support feeding and population growth.

For the Mexico DPS, the physical and biological features associated with critical habitat include prey species, primarily euphausiid zooplankton (*Thysanoessa*, *Euphausia*, and *Nematoscelis* spp.), and small pelagic schooling fishes, such as Pacific sardine (*Sardinops sagax*), northern anchovy (*Engraulis mordax*), Pacific herring (*Clupea pallasii*), capelin (*Mallotus villosus*), juvenile walleye pollock (*Gadus chalcogrammus*), and Pacific sand lance (*Ammodytes personatus*) of sufficient quality, abundance, and accessibility within humpback whale feeding areas to support feeding and population growth.

For the Central America DPS, the physical and biological features associated with critical habitat include prey species, primarily euphausiids (Thysanoessa, Euphausia, Nyctiphanes, and Nematoscelis) and small pelagic schooling fishes, such as Pacific sardine (Sardinops sagax), northern anchovy (Engraulis mordax), and Pacific herring (Clupea pallasii), of sufficient quality, abundance, and accessibility within humpback whale feeding areas to support feeding and population growth.

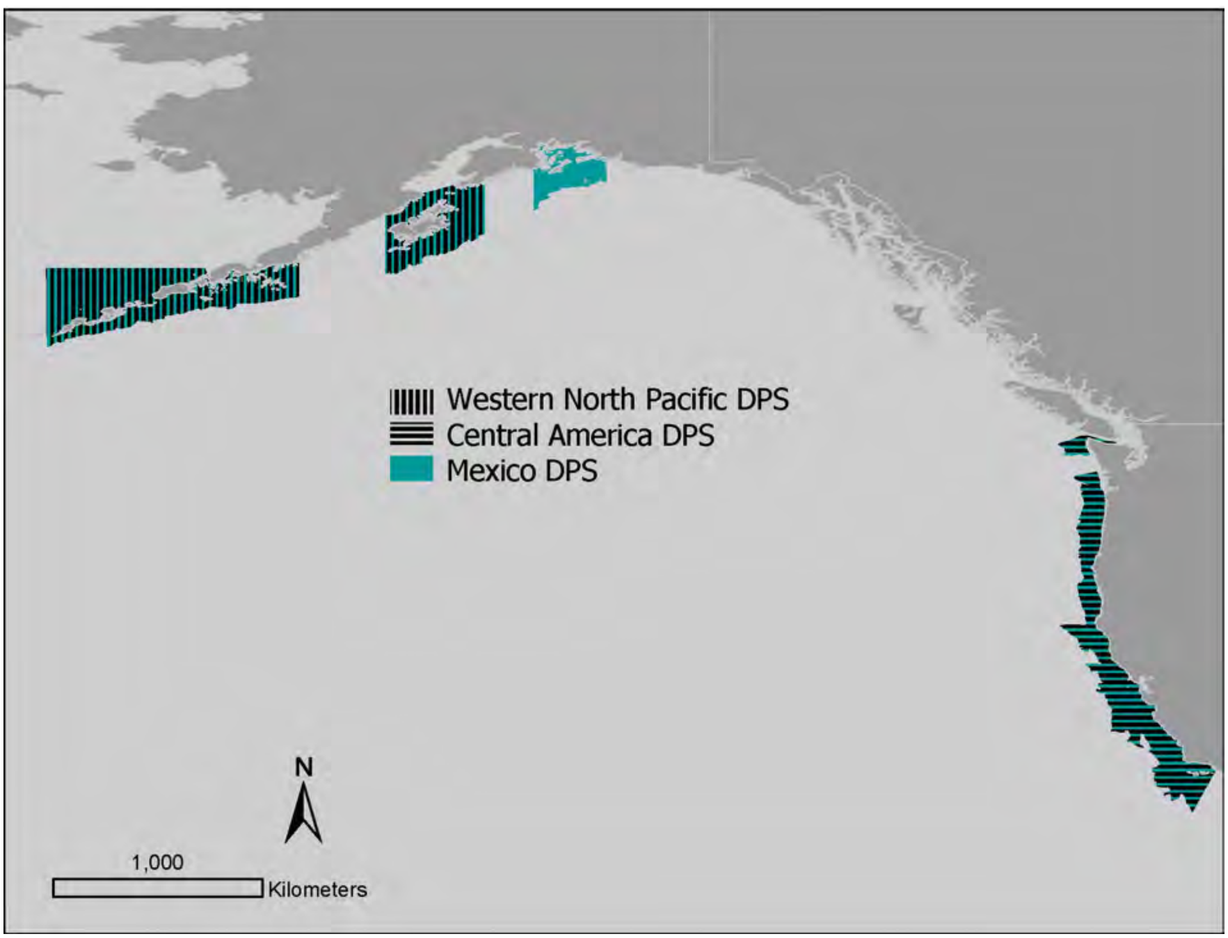

Figure 3. Critical habitat for WNP, Central America, and Mexico DPS humpback whales in waters off Alaska.

Additional information on humpback whale biology, natural history, and critical habitat is available at:

[Humpback Whale Species Description]

[Marine Mammal Stock Assessment Reports: Cetaceans-Large Whales]

[Humpback Whale Critical Habitat]

[Occurrence of Listed Humpback Whales off Alaska]

Humpback whales and critical habitat in the action area

Given their widespread range, relative abundance, opportunistic foraging strategies, and frequent near-shore occurrence, Western North Pacific and Mexico DPS humpback whales may occur in the vicinity of Cold Bay or King Cove. Project barges will transit through areas where Western North Pacific and Mexico DPS humpback whales may be present, regardless of their port of origin, and barges will also transit through critical habitat for both DPSs (Figure 3). Project barges coming from Seattle, WA may also overlap with individuals from the Central America DPS, as well as their critical habitat.

Western North Pacific DPS Gray Whale

The gray whale (*Eschrichtius robustus*) was originally listed as endangered in 1970 (35 FR 8491, June 2, 1970 (baleen whales listing); 35 FR 18319, December 2, 1970 (gray whales)). The Eastern North Pacific (ENP) DPS stock was delisted on June 16, 1994 (59 FR 31094), when it reached pre-exploitation numbers. The Western North Pacific (WNP) population of gray whales remains listed as endangered. Critical habitat has not been designated for WNP DPS gray whales. The WNP DPS gray whales are considered to be gray whales that spend all or part of their lives in the western North Pacific in the waters of Vietnam, China, Japan, Korea (Republic of Korea and/or Democratic People's Republic of Korea), or the Russian Far East, including southern and southeastern Kamchatka but not necessarily areas north of 55°N in eastern Kamchatka (NMFS 2023). Some WNP DPS gray whales spend part of their time in U.S. waters. The population size of the WNP DPS gray whales was estimated from photo-ID data for Sakhalin and Kamchatka at 290 non-calf whales in 2016 (90 percentile intervals = 271-311; Cooke et al. 2017; Cooke 2018). The non-ESA-listed ENP DPS gray whale population is estimated at approximately 19,260 individuals (Eguchi et al. 2024).

Gray whales travel alone or in small, unstable groups and are bottom feeders that remove infaunal invertebrate prey and sediments by suction (Oliver and Slattery 1985). WNP gray whales feed during the summer and fall in the Okhotsk Sea off northeast Sakhalin Island, Russia, and off southeastern Kamchatka in the Bering Sea (Damon-Randall 2023; NMFS 2023). The non-listed ENP population of gray whales feed mainly in the Chukchi, Beaufort, and northwestern Bering seas, with the exception of a small number of whales that summer and feed along the Pacific coast between Kodiak Island, Alaska and northern California (Carretta et al. 2022). The strong matrilineal fidelity exhibited by the whales feeding off Sakhalin Island, suggests behavioral separation of the WNP DPS from the ENP gray whales feeding in the northern Bering Sea (NMFS 2023). Therefore, we do not expect WNP DPS gray whales to be in the Alaskan waters of the Bering Sea.

In the North Pacific Ocean, the current migratory route and wintering areas of the WNP DPS of gray whales is complex and not fully understood (Weller et al. 2015; Weller et al. 2016). Studies support a trans-Pacific Ocean migration for some animals during the winter to areas off Canada, the U.S. West Coast, and Mexico. However, other animals stay in the western North Pacific Ocean and migrate south along the coast of Asia in the winter (Omura 1988; Brownell Jr et al. 2007; Weller and Brownell Jr 2012; Weller et al. 2015; Weller et al. 2016). Satellite tag tracks, photo-identification, and genetic matches between Sakhalin, Kamchatka, Canada, the U.S., and Mexico have identified 60 individuals known to travel between the eastern North Pacific Ocean and western North Pacific Ocean (Weller et al. 2012; Mate et al. 2015; Urban R. et al. 2019; Martinez-Aguilar et al. 2022) leaving open the question about the proportion of the WNP DPS of gray whales that remain in the western North Pacific Ocean year-round. The number of WNP DPS of gray whales remaining in the western North Pacific Ocean year-round is small, likely fewer than 100 individuals (Cooke 2018). The specific migration route and timing of the WNP DPS grays are unknown making it very difficult to predict when and where they might pass through the Aleutian Island chain or along the coast of Alaska.

Based on the best available information, it is expected that approximately 100% of the gray whales found in the western North Pacific Ocean feeding areas (Sakhalin, Kamchatka), wintering areas (Japan and China), and migratory corridor (Eastern Russia, North Korea, South Korea, Vietnam, and Japan) are from the WNP DPS (Damon-Randall 2023). It is expected that approximately 0.4 to 1.6% of the gray whales found in the eastern North Pacific Ocean wintering areas (Mexico) and migratory corridor (United States West Coast [Alaska, Washington, Oregon, and California], Canada, and Mexico) are from the WNP DPS (Damon-Randall 2023). Therefore, there is a low likelihood that a gray whale from the WNP DPS will be encountered in Alaskan waters along the Aleutian Islands, Gulf of Alaska, and Southeast Alaska.

No data are available regarding WNP DPS gray whale hearing and little regarding communication; but we assume that it is similar to the ENP DPS gray. Individuals produce broadband sounds within the 100 Hertz to 12 kHz range (Dahlheim et al. 1984; Jones and Swartz 2009). The most common sounds encountered are on feeding and breeding grounds, where "knocks" with a source level of roughly 142 decibels have been recorded (Thomson and Richardson 1995). Gray whale rattles, clicks, chirps, squeaks, snorts, thumps, knocks, bellows, and sharp blasts at frequencies of 400 Hz to 5 kHz have been recorded in Russian foraging areas (Petrochenko et al. 1991). NMFS categorizes gray whales in the low-frequency cetacean functional hearing group, with an applied frequency range between 7 Hz to 36+ kHz (NMFS 2024).

More information can be found at:

Gray Whale Species Description

Marine Mammal Stock Assessment Report: Cetaceans-Large Whales

2023 WNP DPS Gray Whale Status Review

Western North Pacific gray whales in the action area

Western North Pacific DPS gray whales may overlap with the action area for the proposed project as they do travel through around the Aleutian Islands and the Gulf of Alaska Additionally, project barges transiting through the Gulf of Alaska may encounter WNP DPS gray whales. However, due to the low percentage of gray whales expected to be from the WNP DPS (<1.6 percent), overlap between this DPS and project activities is unlikely.

<u>North Pacific Right Whale</u>

The right whale (*Eubalaena* spp.) was listed as an endangered species under the ESCA in 1970 (35 FR 8491, June 2, 1970 (baleen whales listing); 35 FR 18319, December 2, 1970 (right whales listing)), and continued to be listed as endangered following passage of the ESA. NMFS later divided northern right whales into two separate endangered species: North Pacific right whales (*E. japonica*) and North Atlantic right whales (*E. glacialis*; 73 FR 12024, March 6, 2008). There are likely fewer than 500 North Pacific right whales remaining with less than 50 individuals estimated to remain of the eastern population found in Alaskan waters (Muto et al. 2022). The larger western population, on the coast of Russia and Japan, is outside of United States jurisdiction, so will not be considered further in this consultation.

The eastern North Pacific right whale is distributed from the Bering Sea to Baja California and has been sighted as far west as the Hawaiian islands (Kennedy et al. 2012). Sightings are rare, with the highest number seen in a single year was 17 distinct individuals, sighted over multiple ship surveys in the Southeastern Bering Sea (Wade et al. 2006). North Pacific right whales are primarily found in coastal or shelf waters but sometimes travel into deeper waters. From spring to fall, their distribution is dictated by the distribution of their prey. It is currently unknown if North Pacific right whales migrate to warmer habitats during winter as no migratory route or breeding and calving grounds have been identified and right whales have been sighted and detected acoustically in Alaskan waters in winter months (Wright et al. 2018b; NMFS 2022a)

The North Pacific right whale is the first right whale species documented to produce song and it is hypothesized that these songs are reproductive displays (Crance et al. 2019). The singers whose sex could be determined were all males and it is unknown if females also sing. Four distinct song types were recorded at five distinct locations in the southeastern Bering Sea from 2009-2017. A study of right whale ear anatomy suggests a total possible hearing rage of 10 Hz to 22 kHz (Parks et al. 2007). NMFS categorizes right whales in the low-frequency cetacean functional hearing group, with an applied frequency range between 7 Hz to 36+ kHz (NMFS 2024).

Gulf of Alaska

There have been several sightings and acoustic detections of North Pacific right whales in the Gulf of Alaska over the last few years. The Pacific Marine Assessment Program for Protected Species (PacMAPPS) survey was conducted in August 2021. The goal of the survey was to collect visual and acoustic information on protected species along the shelf and slope waters off Kodiak, AK, and east/southeast of Prince William Sound. Two pairs of North Pacific right whales were sighted during the survey on August 21 and 24, 2021 (Crance et al. 2022), including one whale that had been sighted in off Haida Gwaii, British Columbia several months earlier. Most recently, during the International Whaling Commission's Pacific Ocean Whale and Ecosystem Research (IWC-POWER) survey in 2023, four North Pacific right whales were sighted west of Chirkof Island, not far from where one of the pairs of right whales were sighted in 2021.

Year-round passive acoustic recorders in the Gulf of Alaska, including at the edge of critical habitat off Kodiak Island (Fig. 4), have recorded right whales. The mooring next to critical habitat frequently detects right whale calls and there have also been detections occasionally on recorders in Stephenson Entrance, off Sutwick Island, and in the Shumigan Islands.

Aleutian Islands and Bering Sea

Passive acoustic recorders located in the Bering Sea and Unimak Pass in the Aleutian Islands have detected right whales in the Bering Sea in most months of the year, with a peak in occurrence in known foraging habitats during summer (Wright 2016; Wright et al. 2018a; Crance et al. 2019). Detections were made at Unimak Pass during most months of the year, supporting the idea that right whales may use this area as more than just a corridor to enter and leave the Bering Sea (Wright et al. 2018a). In February 2022, there was an opportunistic sighting of two North Pacific right whales feeding north of Unimak Pass in the Aleutian Islands. This sighting is of particular interest as it is the first time right whales have been visually sighted in the area during that time of year (previous detections have been through acoustic moorings (Wright et al. 2018a)). Video footage confirmed that the whales were feeding, an activity not expected during the winter months when their prey is not as plentiful.

Numerous right whale detections have occurred in the critical habitat area of the southeastern Bering Sea, consistent with satellite tagging results and sightings (Zerbini et al. 2015; Crance et al. 2017; Crance et al. 2019). Detections and sightings have also occurred in the northern Bering Sea, including in the vicinity of St. Lawrence Island (Wright et al. 2019; Matsuoka et al. 2022), and acoustic detections have been increasing in frequency in recent years in this area (Wright et al. 2019).

North Pacific Right Whale Critical Habitat

Critical habitat was designated for northern right whales in the North Pacific in 2006 (71 FR 38277, July 6, 2006). When North Pacific right whales were listed as their own unique species in 2008 (73 FR 12024, March 6, 2008), critical habitat was re-designated with very minor changes (73 FR 19000, April 8, 2008). The physical or biological features (PBFs) deemed necessary for the conservation of North Pacific right whales are concentrations of the copepods *Calanus marshallae*, *Neocalanus cristatus*, and *N. plumchris*, and the euphausiid *Thysanoessa raschii*, in areas where North Pacific right whales are known or believed to feed (50 CFR 226.215). Additionally, it is likely that certain physical forcing mechanisms are present in these areas and act to concentrate the identified prey species in densities that allow for efficient foraging by right whales (Figure 4).

On March 10, 2022, NMFS received a petition from the Center for Biological Diversity and Save the North Pacific Right Whale requesting revision to the critical habitat designation for the North

Pacific right whale. We published a positive 90-day finding on July 12, 2022, stating the petition presented substantial scientific information indicating that the petitioned action may be warranted (87 FR 41271, July 12, 2022). After conducting a review of currently designated critical habitat and soliciting public comment to inform the review process, we published a 12-month finding indicating that a revision of critical habitat is warranted and described our approach for developing a proposed rule for public comment (88 FR 65940; September 26, 2023). This process is currently ongoing.

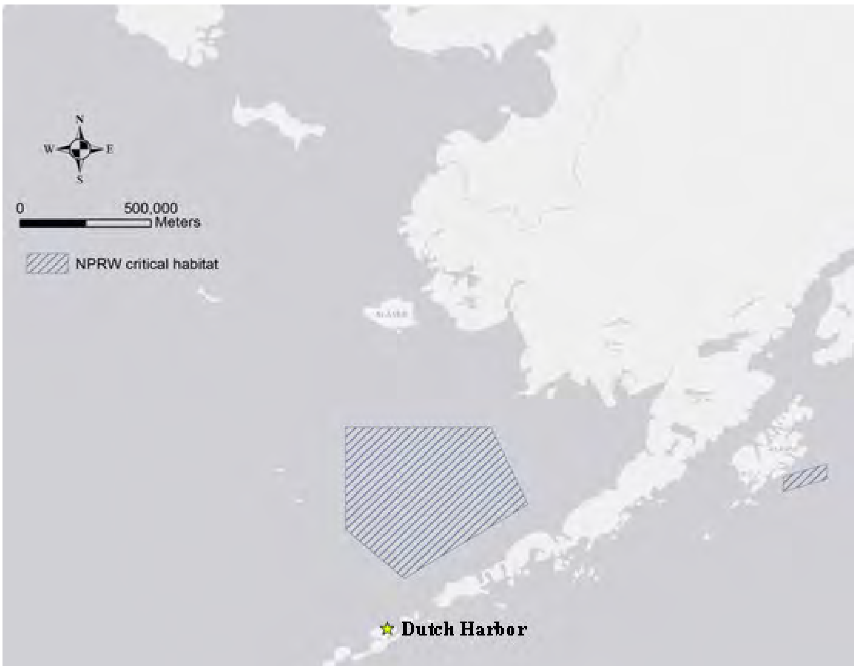

Figure 4. North Pacific right whale critical habitat in the Bering Sea and Gulf of Alaska.

Information on biology and habitat of the North Pacific right whale is available at:

North Pacific Right Whale Species Description

Marine Mammal Stock Assessment Reports: Cetaceans-Large Whales

North Pacific Right Whale Critical Habitat

North Pacific right whales and critical habitat in the action area

Overlap with North Pacific right whales and project activities could occur, particularly during project vessel transit. While North Pacific right whales have been sighted close to shore along the Alaska Peninsula and around Kodiak Island, there have not been any sightings in or around Cold Bay and King Cove. However, project barges will be passing through areas in the Gulf of Alaska where right whales have been both sighted and detected acoustically. Barges transiting from Kodiak or Cook Inlet may also pass through North Pacific right whale critical habitat off the southern coast of Kodiak Island (Figure 4). However, the rarity of the whales and limited number of project specific barge trips makes the likelihood of encounters extremely rare.

Sei Whale

The sei whale (*Balaenoptera borealis*) was listed as an endangered species under the ESCA in, 1970 (35 FR 8491, June 2, 1970 (baleen whales listing); 35 FR 18319, December 2, 1970 (sei whale listing)) and continued to be listed as endangered following the passage of the ESA. Under the MMPA, two stocks of sei whales are currently recognized within the U.S. Pacific waters: Eastern North Pacific and Hawaii (Carretta et al. 2020). The two stocks are not recognized separately under the ESA. Critical habitat has not been designated for sei whales.

Sei whale abundance in the North Pacific pre-whaling was estimated to be 42,000 whales (Tillman 1977). Based on visual line-transect surveys conducted between 2010 and 2012, sei whale abundance in the central and eastern North Pacific is estimated at 29,632 whales (Hakamada et al. 2017). The best estimate of abundance for California, Oregon, and Washington waters is 519 whales, based on line transect surveys in 2008 and 2014 (Barlow 2016).

Sei whales are distributed far out to sea in temperate waters worldwide and do not appear to be associated with coastal features. In Alaskan waters, sei whales have been reported primarily south of the Aleutian Islands, in Shelikof Strait and waters surrounding Kodiak Island, in the Gulf of Alaska, and inside waters of Southeast Alaska (Leatherwood et al. 1982). The fine baleen structure of the sei whales allows them to skim the surface waters for patches of their preferred copepod prey. Sei whales also feed on euphausiids, shoals of fish, and squid if they are encountered (Harwood 2017).

Sei whales make low and mid frequency vocalizations including upsweep and downsweep calls, pulse trains, and growls. NMFS categorizes sei whales in the low-frequency cetacean functional hearing group, with an applied frequency range between 7 Hz and 36+ kHz (NMFS 2024).

More information on sei whale biology and habitat is available at:

Sei Whale Species Description

Marine Mammal Stock Assessment Reports: Cetaceans-Large Whales

2021 Status Review

2016 Recovery Plan

Sei whales in the action area

Because sei whales are not associated with coastal features we do not expect that any individuals would be affected by effects from project activities in or around Cold Bay or King Cove. It is possible that project barges could pass through habitat occupied by sei whales in the Gulf of Alaska.

Sperm Whale

The sperm whale (*Physeter macrocephalus*) was listed as an endangered species under the ESCA in 1970 (35 FR 8491, June 2, 1970; 35 FR 18319, December 2, 1970), and continues to be listed as endangered following passage of the ESA. Critical habitat has not been designated for sperm whales. Sperm whales are globally distributed and have extensive home ranges that can span ocean basins. The population structure of sperm whales has not been adequately defined, and there are no recent and reliable estimates for population size or trend for sperm whales off Alaska (i.e., the North Pacific Stock) (NMFS 2010b; Young et al. 2023).

Sperm whales are primarily found in deep waters, and sightings of sperm whales in water less than 300 m (984 ft) are uncommon. They are usually found far offshore, except in cases where the shelf break or submarine canyons occur close to land (Mizroch and Rice 2013). They feed primarily on medium-sized to large-sized squids but also take substantial quantities of large demersal and mesopelagic sharks, skates, and fishes (Rice 1989). Research suggests that sperm whales are relatively nomadic, with movements closely tied to geographical and temporal variations in the abundance of pelagic squids (Mizroch and Rice 2013). Sperm whales exhibit latitudinal sex segregation; all age classes and both sexes range throughout temperate and tropical regions, but only males move into higher latitudes to forage (NMFS 2010b). Females, dependent young, and immature males form cohesive social groups, while young males form bachelor groups and ultimately become solitary as they sexually mature. Adult males show variable movement patterns at high latitude feeding grounds, and periodic, but not seasonal, directed transits into low latitude feeding/breeding grounds with repeat visitation to female groups (Whitehead 2003; Straley et al. 2014). However, movement patterns are complex and timing of departure into lower latitudes is variable among individual whales (Straley et al. 2014).

During the summer months, adult males are found in the Gulf of Alaska, Bering Sea, and waters around the Aleutian Islands (Mizroch and Rice 2013). Females and juveniles generally remain in tropical and temperate latitudes, ranging no further than 50-51 °N in the southern Gulf of Alaska. Discovery Mark data from commercial whaling days indicate extensive movement of females into the Gulf of Alaska, western Aleutians, and Bering Sea occurred historically (NMFS 2010b; Mizroch and Rice 2013). Matrilineal groups are considered to rarely occur in Alaskan waters currently. However, contemporary studies document the presence of female social groups in the Gulf of Alaska and Aleutian Islands (Fearnbach et al. 2012; Rone et al. 2017; Posdaljian et al. 2024), possibly representing a return to pre-whaling distributions of sperm whales.

Sperm whales produce a variety of loud, low-frequency clicks ranging from 0.1 to 20 kHz, with source levels up to 236 dB re 1µPa (Weilgart and Whitehead 1993; Goold and Jones 1995; Møhl et al. 2003; Weir and Goold 2007). These include patterned clicks (codas), which are used during social behavior and in interactions within social groups, usual clicks which are used during foraging/diving behavior, creaks (a series of rapid clicks), associated with prey detection, and slow clicks believed to be only produced by males in the context of mating (Whitehead and Weilgart 1991; Weilgart and Whitehead 1993; Miller et al. 2004; Rendell and Whitehead 2004; Zimmer et al. 2005). Sperm whales are odontocetes (toothed whales) and are considered high-frequency cetaceans with an applied frequency range of 150 Hz to 160 kHz (NMFS 2024). The only direct measurement of hearing was from a young stranded individual from which auditory evoked potentials were recorded and indicated a hearing range of 2.5 to 60 kHz (Carder and Ridgway 1990).

Aleutian Islands and Bering Sea

Sperm whales have been frequently documented in the western Aleutian Islands, from Unalaska to the east out to the far islands. Surveys conducted by Forney and Brownell Jr. (1996) south of the eastern Aleutians found sperm whales in depths from 4,000-5,000 m over the Aleutian Abyssal Plain or north of the Aleutian Trench over deep basins. During 12 cetacean surveys in the summers of 2001-2007 and 2009-2010, 393 sightings of adult male sperm whales were made (Fearnbach et al. 2012). They were considered the most frequently sighted large cetacean in coastal waters around the central and western Aleutian Islands (Allen and Angliss 2011). In February 2008, a group of approximately 50 female and immature sperm whales were seen near Koniuji Island, in the central Aleutian Islands (Fearnbach et al. 2012). This was the first time such a large aggregation of females and juveniles were seen so far north since whaling ended. More recent studies by Posdaljian et al. (2024) acoustically detected female groups in the Aleutian Islands, with peak presence occurring in winter.

Gulf of Alaska

Results from acoustic surveys indicate that sperm whales are present in the Gulf of Alaska year-round where they are most common in the summer months along the continental break and slope (Mellinger et al. 2004; Straley et al. 2014; Rone et al. 2017; Diogou et al. 2019). They have been documented interacting with demersal longline fisheries in the Gulf of Alaska since the 1970s (Straley et al. 2014; Wild et al. 2017; Hanselman et al. 2018). In July of 2021, a sperm whale became entangled in gear used by the Alaska Fisheries Science Center's Alaska Longline Survey. The interaction resulted in a live release; the whale swam away with no visible gear wrapped around it and is assumed to have survived with no major effects (Eco49 2022). Recent studies by Posdaljian et al. (2024) acoustically detected female social groups in the Gulf of Alaska, with peak presence occurring in the spring at offshore seamount locations.

Additional information on sperm whale biology and habitat is available at:

[Sperm Whale Species Description]

[2015 Status Review]

[Marine Mammal Stock Assessment Reports: Cetaceans-Large Whales]

Sperm whales in the action area

Because sperm whales occur in coastal waters of the central Aleutian Islands, there is the possibility that they might be near the proposed action area, though not likely to be found within Cold Bay or King Cove. Project barges could overlap with sperm whales as they transit through the Gulf of Alaska.

Cook Inlet Beluga Whale

Cook Inlet beluga whales are geographically and genetically isolated from other beluga whale stocks in Alaska. NMFS designated the Cook Inlet beluga (*Delphinapterus leucas*) population as depleted under the MMPA in 2000 (65 FR 34590; May 31, 2000) after its population dropped from approximately 1,300 individuals in 1979 to 347 in 1998. A lack of subsequent population growth led NMFS to list the Cook Inlet beluga as endangered under the ESA effective on December 22, 2008 (73 FR 62919; October 22, 2008). Currently, the best abundance estimate for the Cook Inlet beluga whale population is 331 whales (95 percent probability interval 290 to 386) based on a 2022 beluga aerial survey (Goetz et al. 2023).

Although they remain year-round in Cook Inlet, they demonstrate seasonal movements within the inlet. In general, during the summer and fall, beluga whales occur in shallow coastal waters and are concentrated near the Susitna River Delta, Knik Arm, Turnagain Arm, Chickaloon Bay, and near Fire Island in the upper inlet (Shelden et al. 2015; Castellote et al. 2016; McGuire et al. 2020), and the Kenai River Delta in the lower Inlet (McGuire et al. 2020; Kumar et al. 2024). During the winter, they are more dispersed, occurring in deeper waters in the mid-inlet to Kalgin Island, and in the shallow waters along the west shore of Cook Inlet to Kamishak Bay. While ice formation in the upper inlet was once thought to restrict beluga's access to nearshore habitat (Ezer et al. 2013), tagging data, acoustic studies, visual surveys, and opportunistic sightings indicate that Cook Inlet belugas continue to occur in the upper inlet throughout the winter months, in particular the coastal areas from Trading Bay to Little Susitna River, with foraging behavior detected in lower Knik Arm and Chickaloon Bay, and also detected in several areas of the lower inlet such as the Kenai River, Tuxedni Bay, Big River, and NW Kalgin Island (Shelden et al. 2015; Shelden et al. 2018; Castellote et al. 2020; Castellote et al. 2021; Castellote et al. 2023; NMFS unpublished data). The area around the East Forelands between Nikiski, Kenai, and Kalgin Island as well as Tuxedni Bay appears to provide important habitat in winter, early spring, and fall (Castellote et al. 2023; NMFS unpublished data).

The distribution of Cook Inlet belugas has changed significantly since the 1970s. Information on Cook Inlet beluga distribution, including aerial surveys and acoustic monitoring, indicates that the species' range in Cook Inlet has contracted markedly since the 1990s (Shelden and Wade 2019). This distributional shift and range contraction coincided with the decline in abundance (Moore et al. 2000; NMFS 2008a; Goetz et al. 2012).

Cook Inlet beluga whales have diverse diets (Quakenbush et al. 2015; Nelson et al. 2018), foraging on fish and benthos, often at river mouths. Primary prey species consist of four species of Pacific salmon (Chinook, sockeye, chum, and coho), Pacific eulachon, Pacific cod, walleye pollock, saffron cod, and yellowfin sole. Belugas seasonally shift their distribution within Cook Inlet in relation to the timing of fish runs (NMFS 2016).

NMFS categorizes Cook Inlet beluga whales in the mid-frequency cetacean functional hearing group, with an applied frequency range between 150 Hz and 160 kHz (NMFS 2024).

Cook Inlet Beluga Whale Critical Habitat

NMFS published designated critical habitat for the Cook Inlet beluga whale on April 11, 2011 (76 FR 20180), delineating two areas (aptly named Area 1 and Area 2) that generally describe summer (Area 1) vs. winter (Area 2) habitat, respectively (Figure 5).

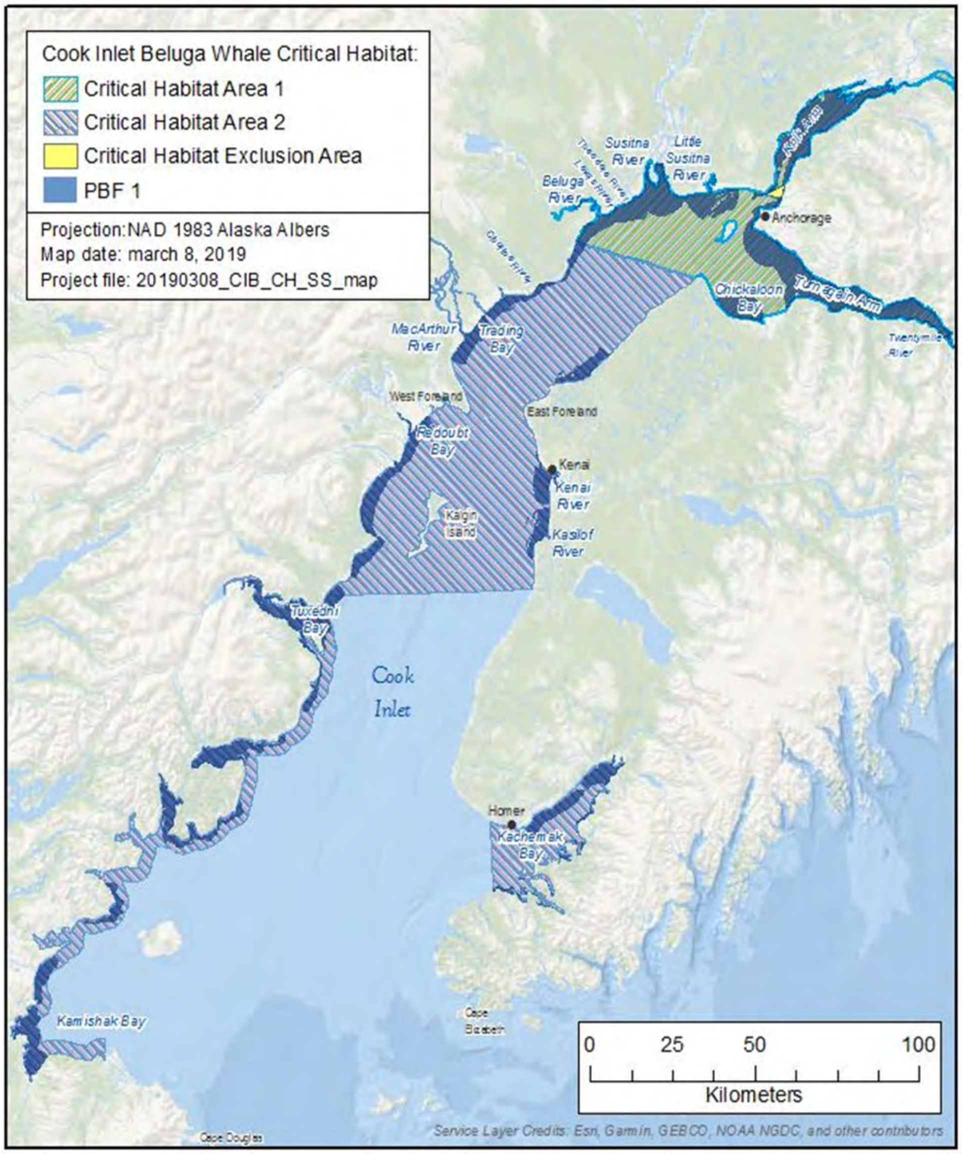

Figure 5. Cook Inlet Beluga Whale Critical Habitat (50 CFR § 226.220).

Cook Inlet beluga whale critical habitat includes five Physical or Biological Features (PBFs) that were deemed essential to the conservation of the stock:

1. Intertidal and subtidal waters of Cook Inlet with depths less than 30 feet mean low low water (MLLW) and within five miles of high and medium flow anadromous fish streams.

2. Primary prey species consisting of four species of Pacific salmon (Chinook, sockeye, chum, and coho), Pacific eulachon, Pacific cod, walleye Pollock, saffron cod, and yellowfin sole.

3. Waters free of toxins or other agents of a type and amount harmful to Cook Inlet beluga whales.

4. Unrestricted passage within or between the critical habitat areas.

5. Waters with in-water noise below levels resulting in the abandonment of critical habitat areas by Cook Inlet beluga whales.

NMFS excluded from critical habitat two areas in upper Cook Inlet near the Port of Anchorage and Joint Base Elmendorf-Richardson (50 CFR 226.220).

More information on Cook Inlet beluga whale biology and habitat is available at:

Beluga Whale Species Description

Marine Mammal Stock Assessment: Cetaceans-Small Whales

2022 Status Review

2016 Recovery Plan

Cook Inlet Beluga Critical Habitat

Cook Inlet beluga whales and critical habitat in the action area

Cook Inlet belugas are not expected to overlap with the proposed action area in and around Cold Bay and King Cove. The only project activity that could overlap with this species and its critical habitat would be if project barges transit through Cook Inlet to pick up project-related supplies from Anchorage.

Southern Resident Killer Whale

Eastern North Pacific Southern Resident killer whales are the only endangered population of killer whales in the United States, ranging from central California to Southeast Alaska. The Southern Resident killer whale DPS was listed as endangered under the ESA in 2005 (70 FR 69903; Nov. 18, 2005). In the listing, NMFS identified three main threats to their survival: 1) scarcity of prey, 2) high levels of contaminants from pollution, and 3) disturbance from vessels and sound.

The estimated minimum historical population of Southern Resident killer whales numbered about 140 animals. Although there was some growth in the population in the 1970s and 1980s, with a peak of 98 animals in 1995, the population experienced a decline of almost 20 percent in the late 1990s, leaving 80 whales in 2001. As of July 1, 2021, after the summer census, there were only 74 individuals left in the population (NMFS 2022b).

During the spring, summer, and fall, the range of Southern Resident killer whales includes the coastal and inland waterways of Washington State and the transboundary waters between the United States and Canada. They have been spotted as far south as central California during the winter months and as far north as Southeast Alaska1.

[1] https://www.fisheries.noaa.gov/species/killer-whale/spotlight

Southern Resident Killer Whale Critical Habitat

NMFS published a final rule to designate critical habitat for Southern Resident DPS killer whales on November 29, 2006 (71 FR 69054). On August 2, 2021, NMFS published a revision to that rule designating six additional coastal areas along the U.S. West Coast (86 FR 41668, August 2, 2021). Critical habitat is now designated to include inland waters of Washington State for three specific marine areas of Puget Sound and surrounding waters, and six specific marine areas along the coasts of Washington, Oregon, and California (86 FR 41668, August 2, 2021). The final rule, which was revised in 2021, identified the following physical and biological features: 1) water quality to support growth and development, 2) prey species of sufficient quantity, quality, and availability to support individual growth, reproduction, and development, as well as overall population growth, and 3) passage conditions to allow for migration, resting, and foraging. Based on these PBFs, the final rule expanded the critical habitat to include approximately 15,910 square miles of marine waters between the 20-foot (6.1-meter) and 656.2-foot (200-meter) depth contours, extending from the U.S.-Canada border to Point Sur, California (50 CFR 226.206) (Figure 6).

Figure 6. Southern Resident killer whale revised critical habitat.

More information about Southern Resident killer whale biology and habitat is available at:

[Southern Resident Killer Whale Species Description]

[Marine Mammal Stock Assessment: Cetaceans-Small Whales]

[2022 Status Review]

[2008 Recovery Plan]

[Southern Resident Killer Whale Critical Habitat]

Southern Resident killer whales and critical habitat in the action area

The species does not occur within King Cove, Cold Bay, or the vast majority of the potential vessel transit routes. If project barges originate from Seattle, WA, there is a potential for them to transit through Southern Resident killer whale critical habitat including Puget Sound, a narrow area in the Strait of Juan de Fuca, and waters immediately off the coast of Washington.

Western DPS Steller Sea Lion

The Steller sea lion (*Eumetopias jubatus*) was listed as a threatened species under the ESA effective December 4, 1990 (55 FR 49204, November 26, 1990). Based on genetic, morphological, ecological, and population trend data, NMFS reclassified the Steller sea lion into two DPS's, effective June 4, 1997 (62 FR 24345, May 5, 1997). The western DPS, comprised of animals originating from breeding sites west of 144° W longitude, was listed as endangered due to persistent decline and lack of recovery, while the eastern DPS remained listed as threatened. Effective on December 4, 2013, the eastern DPS was removed from the endangered species list (78 FR 66140, November 4, 2013).

The western stock of the Steller sea lion decreased from 220,000 to 265,000 animals in the late 1970s to less than 50,000 in 2000 (Loughlin et al. 1984; Loughlin and York 2000; Burkanov and Loughlin 2005). The sharp drop in abundance of the WDPS observed in the 1980s was caused largely by a steep decline in juvenile survival and a smaller decline in adult survival (York 1994; Holmes and York 2003). The minimum population estimate for the U.S. portion of the range of WDPS Steller sea lions in 2023 was 49,320 Steller sea lions; 11,987 pups (95% credible interval of 11,291-12,703) and 37,333 non-pups (95% credible interval of 34,274-40,245), respectively (Sweeney et al. 2023). Non-pups and pups in the WDPS of Alaska increased 1.05 and 0.50% y-1, respectively, between 2007 and 2022; however, there was high variability among regions (Sweeney et al. 2023). Steller sea lions in the western Aleutian Islands region continued to decline, along with pups in the adjacent central Aleutian Islands region. East of Samalga Pass, Aleutian Islands, pup production slowed or plateaued in the early 2010s, with subsequent non-pup plateauing or declines starting in the late 2010s in all regions (Sweeney et al. 2023). The 2014-2016 North Pacific marine heatwave (PMH), one of the most severe heatwaves ever recorded, resulted in reduced survival of adult female Steller sea lions in the Gulf of Alaska and reduced survival of adult female and adult male Steller sea lions in Southeast Alaska (Hastings et al. 2023) indicating that Steller sea lion populations in Alaska remain sensitive to environmental anomalies such as these (Suryan et al. 2021; Hastings et al. 2023).

Steller sea lions range throughout the North Pacific Ocean occurring from central California along the Pacific Rim through Alaska and Russia to Japan (Kenyon and Rice 1961; Loughlin et al. 1984). The WDPS of Steller sea lions are primarily found north of Sumner Strait in Southeast Alaska (Hastings et al. 2020). Most adult Steller sea lions occupy rookeries during the summer pupping and breeding season (mid-May through July) and exhibit a high level of site fidelity (Raum-Suryan et al. 2002; Hastings et al. 2017). During the breeding season, some juveniles and non-breeding adults occur at or near the rookeries, but most are on haulouts (sites that provide regular retreat from the water on exposed rocky shoreline, gravel beaches, and ice) (Call and Loughlin 2005; Ban and Trites 2007). Steller sea lions disperse widely after the breeding season, likely to access seasonally important prey resources (Gende and Sigler 2006; Sigler et al. 2009; Womble et al. 2009). During fall and winter many sea lions disperse from rookeries and increase use of haulouts, particularly on terrestrial sites but also on sea ice in the Bering Sea (Calkins 1998).

Steller sea lions forage near and off shore, in both benthic and pelagic zones, and eat a wide variety of prey, including many species of fish and cephalopods (including squid and octopus) (Pitcher and Calkins 1981; Calkins and Goodwin 1988; Calkins 1998; Sinclair et al. 2013; Tollit et al. 2017), and occasionally other marine mammals and birds (Pitcher and Fay 1982; NMFS 2008b). During the breeding season, adult females must forage close enough to her rookery to return often to nurse her pup. Females attending pups usually forage within 20 nm of breeding rookeries (Merrick and Loughlin 1997), which is the basis for designated critical habitat around rookeries and major haulout sites. Steller sea lions are not known to migrate annually, but individuals, especially juveniles and males, may disperse widely outside of the breeding season (Raum-Suryan et al. 2004; Trites et al. 2006; Lander et al. 2009; Jemison et al. 2013; Fritz et al. 2016; Sigler et al. 2017; Jemison et al. 2018).

The ability to detect sound and communicate underwater is important for a variety of Steller sea lion life functions, including reproduction and predator avoidance. NMFS categorizes Steller sea lions in the otariid pinniped functional hearing group, with an applied frequency range between 60 Hz to 68 kHz in water (NMFS 2024).

Steller Sea Lion Critical Habitat

NMFS designated critical habitat for Steller sea lions on August 27, 1993 (58 FR 45269; Figure 7 & Figure 8). In Alaska, designated critical habitat includes the following areas as described at 50 CFR 226.202.

1. Terrestrial zones that extend 3,000 feet (0.9 km) landward from each major haulout and major rookery in Alaska.

2. Air zones that extend 3,000 feet (0.9 km) above the terrestrial zone of each major haulout and major rookery in Alaska.

3. Aquatic zones that extend 3,000 feet (0.9 km) seaward of each major haulout and major rookery in Alaska that is east of 144° W longitude.

4. Aquatic zones that extend 20 nm (37 km) seaward of each major haulout and major rookery in Alaska that is west of 144° W longitude.

5. Three special aquatic foraging areas: the Shelikof Strait area, the Bogoslof area, and the Seguam Pass area, as specified at 50 CFR 226.202(c).

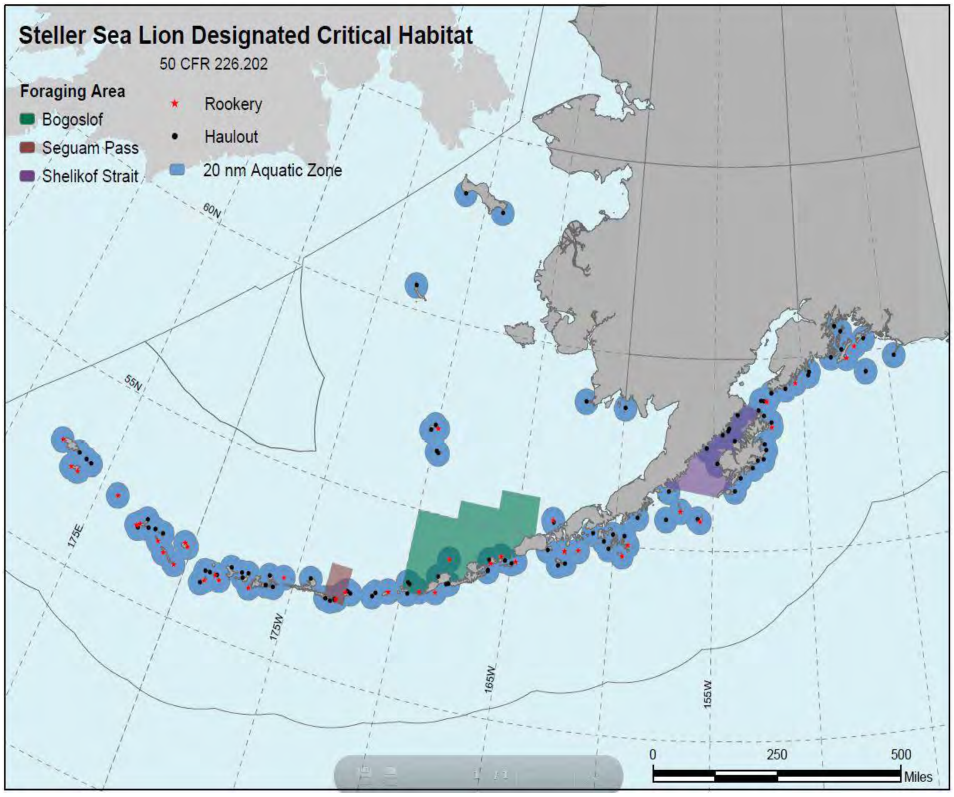

Figure 7. Designated Steller sea lion critical habitat in Alaska.

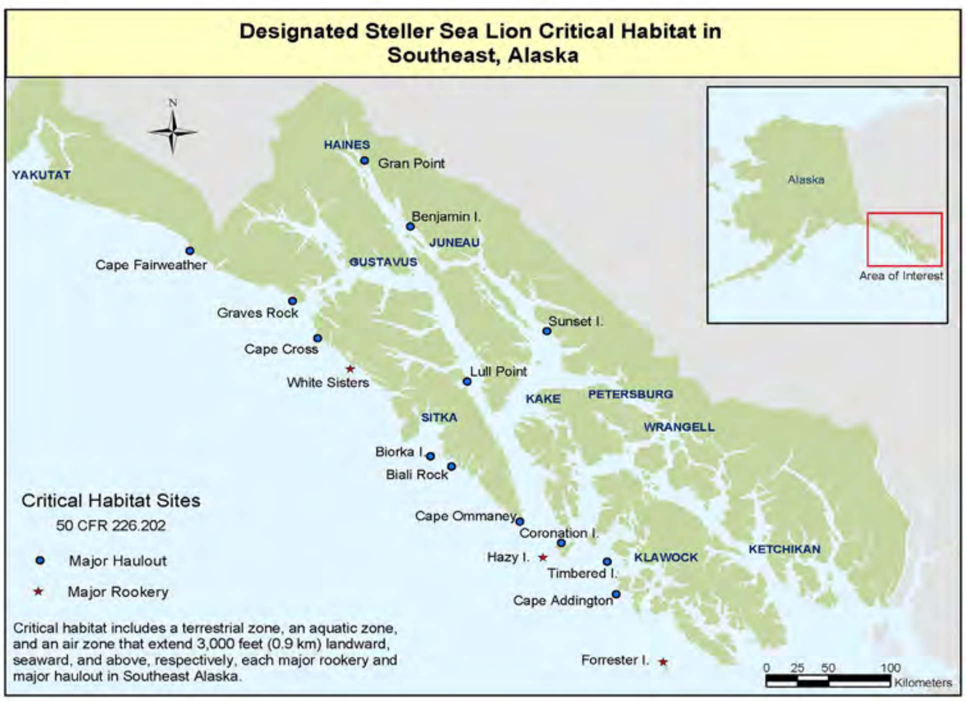

Figure 8. Designated critical habitat for Steller sea lions in Southeast Alaska.

Information on Steller sea lion biology and habitat is available at:

Steller Sea Lion Species Description

Marine Mammal Stock Assessment Reports: Pinnipeds-Otariids

2020 Status Review

Occurrence of Western DPS Steller Sea Lions East of 144º W. Longitude

Steller Sea Lion Critical Habitat

WDPS Steller sea lions and critical habitat in the action area

While information on Steller sea lion habitat use and average occurrence in the action area is limited, this species may be found year-round in Cold Bay and in numbers ranging up to 50 animals at a time (USFWS 2025). Most Steller sea lion observations occur during the summer when salmon are present and sea lions feed near spawning streams and fish cleaning areas. They are more likely to be observed near the mouth of the bay, though there are sightings from up near Kinzarof Lagoon (USFWS 2025). Izembek NWR also serves as a foraging and resting area for Steller sea lions.

There are no haulouts or rookeries within the action area – the closest are haulouts at Amak Island (11 mi north) and Sea Lion Rocks (15 miles north). However, the 20 nm aquatic zones for these haulouts extend into the action area, covering Izembek Lagoon and across land into Kinzarof Lagoon. To the south, there are two rookeries on Clubbing Rocks North and South, which have aquatic zones that extend to mouth of King Cove, but do not reach Cold Bay or the two hovercraft sites. However, project barges may transit through these aquatic zones.

Sunflower Sea Star

On August 18, 2021, the Center for Biological Diversity petitioned NMFS to list the sunflower sea star (*Pycnopodia helianthoides*) under the ESA. NMFS determined that the proposed action may be warranted (86 FR 73230, December 27, 2021) and completed a full status review to evaluate overall extinction risk for the species. NMFS determined that the sunflower sea star is likely to become an endangered species within the foreseeable future throughout its range and on March 16, 2023, published a proposed rule to list the sunflower sea star as a threatened species (88 FR 16212). NMFS did not propose to designate critical habitat at this time. No specific populations of sunflower sea stars have been delineated and they are assumed to be genetically homogenous throughout their range (Lowry et al. 2022).

The sunflower sea star is a large (up to 1 m in diameter) many-armed (up to 24) echinoderm native to the west coast of North America (Lowry et al. 2022). It occupies waters from the intertidal to at least 435 m deep, but is most common at depths less than 25 m and rare in waters deeper than 120 m (Lambert 2000; Hemery et al. 2016; Gravem et al. 2021). Sunflower sea stars occur over a broad array of soft-, mixed-, and hard-bottom habitats from the Aleutian Islands to Baja California, Mexico, but are most abundant in waters off eastern Alaska and British Columbia (Gravem et al. 2021).

Prior to 2013, the global abundance of sunflower sea star was estimated at several billion animals, but from 2013–2017 sea star wasting syndrome (SSWS) reached pandemic levels, killing an estimated 90 percent or more of the population (Lowry et al. 2022). Declines in the northern portion of its range were less pronounced than in the southern portion, but still exceeded 60 percent. Species-level impacts from SSWS, both during the pandemic and on an ongoing basis, have been identified as the major threat affecting the long-term persistence of the sunflower sea star (Lowry et al. 2022).

The species has separate sexes and is a broadcast spawner with a planktonic larval stage (Lundquist and Botsford 2011), but there is a great degree of uncertainty and variability regarding seasonality of reproduction. Females can release a million eggs or more (Strathmann 1987; Chia and Walker 1991; Byrne 2013). Reproduction also occurs via larval cloning, enhancing potential reproductive output beyond female fecundity (Bosch et al. 1989; Balser 2004). Sea stars also have the ability to regenerate lost rays/arms and parts of the central disc (Chia and Walker 1991). Rays may detach when a sea star is injured or as a defense reaction when attacked by a predator. The longevity of *P. helianthoides* in the wild is unknown, as is the age at first reproduction and the period over which a mature individual is capable of reproducing (Lowry et al. 2022).

The sunflower sea star hunts a range of bivalves, gastropods, crustaceans, and other invertebrates using chemosensory stimuli and will dig for preferred prey in soft sediment (Mauzey et al. 1968; Paul and Feder 1975; Herrlinger 1983). A voracious mesopredator, it can move up to 160 cm/minute when actively in pursuit of prey. It preys on sea urchins and plays an important role in controlling sea urchin numbers in kelp forests (Lowry et al. 2022). While generally solitary, they are also known to seasonally aggregate, perhaps for spawning purposes.

More information on the sunflower sea star can be found at:

Proposed Rule to List Sunflower Sea Stars as Threatened Under the ESA

Sunflower Sea Star Status Review

Sunflower sea stars in the action area

Sunflower sea stars are known to inhabit portions of Cold Bay. The Alaska Department of Fish and Game's trawl survey catch in 2019 consisted of 0.66 percent (109 kg) of sunflower sea star[2]. It is likely that sunflower sea stars are present in the areas for the proposed barge landing sites at the Northeast Terminal and Cross Wind Cove (Figure 2).

Effects of the Action

"Effects of the action" are all consequences to listed species or critical habitat that are caused by the proposed action, including the consequences of other activities that are caused by the

[2] Unpublished ADF&G Cold Bay survey catch data from 2019 and 2023. Data provided to AECOM via email correspondence with K. Spalinger. on February 2, 2024.

proposed action. A consequence is caused by the proposed action if it would not occur but for the proposed action and it is reasonably certain to occur. Effects of the action may occur later in time and may include consequences occurring outside the immediate area involved in the action (50 CFR 402.02). The applicable standard to find that a proposed action may affect but is “not likely to adversely affect” listed species or critical habitat is that all of the effects of the action are expected to be insignificant, extremely unlikely to occur, or completely beneficial. “Insignificant effects” relate to the magnitude of the impact and are those that one would not be able to meaningfully measure, detect, or evaluate; insignificant effects should never reach the scale where take occurs.

While the ESA does not define “harass,” NMFS issued guidance interpreting the term “harass” under the ESA as to: “create the likelihood of injury to wildlife by annoying it to such an extent as to significantly disrupt normal behavioral patterns which include, but are not limited to, breeding, feeding, or sheltering” (Wieting 2016). NMFS considers the following steps to assess whether proposed activities are likely to harass.

1. Whether an animal is likely to be exposed to a stressor or disturbance (i.e., an annoyance).

2. The nature of that exposure in term of magnitude, frequency, duration, etc. Included in this may be type and scale as well as considerations of the geographic area of exposures (e.g., is the annoyance within a biologically important location for the species, such as a foraging area, spawning/breeding area, or nursery area?).

3. The expected response of the exposed animal to a stressors or disturbance (e.g., startle, flight, alteration [including abandonment] of important behaviors).

4. Whether the nature and duration or intensity of that response is a significant disruption of those behavior patterns which include, but are not limited to, breeding, feeding, sheltering, resting, or migrating.

The potential effects of the proposed action on listed species and critical habitat are acoustic disturbance (road and bridge construction, vessel noise), vessel strike, incidental spills, and habitat alteration.

<u>Acoustic Thresholds</u>

Since 1997, NMFS has used generic sound exposure thresholds to determine whether an activity produces underwater and in-air sounds that might result in impacts to marine mammals (70 FR 1871, 1872, January 11, 2005). NMFS developed comprehensive guidance on sound levels likely to cause injury to marine mammals through onset of permanent and temporary threshold shifts (PTS and TTS) (89 FR 84872; October 24, 2024, 83 FR 28824, June 21, 2018). NMFS is in the process of developing guidance for behavioral disruption.

However, until such guidance is available, NMFS uses the following conservative thresholds of underwater sound pressure levels, expressed in root mean square (rms), from broadband sounds that cause behavioral disturbance, and referred to as Level B harassment under section 3(18)(A)(ii) of the Marine Mammal Protection Act (MMPA; 16 U.S.C. 1362(18)(A)(ii)):

- impulsive sound: 160 dB_{rms} re 1 μPa
- continuous sound: 120 dB_{rms} re 1μPa

The generalized hearing range for each hearing group is provided in Table 2.

Table 2. Underwater marine mammal hearing groups (NMFS 2024).

Hearing Group^	**ESA-listed Marine Mammals in the Action Area**	**Generalized Hearing Range***
Low-frequency (LF) cetaceans *(Baleen whales)*	Blue, Sei, Humpback, Fin, Gray, and North Pacific right whales	7 Hz to 36+ kHz
High-frequency (HF) cetaceans *(dolphins, toothed whales, beaked whales)*	Cook Inlet beluga and Sperm whales	150 Hz to 160 kHz
Very High-frequency (VHF) cetaceans *(true porpoises)*	None	200 Hz to 165 kHz
Phocid pinnipeds (PW) *(true seals)*	None	40 Hz to 90 kHz
Otariid pinnipeds (OW) *(sea lions and fur seals)*	Western DPS Steller sea lions	60 Hz to 68 kHz

^ Southall et al. 2019 indicates that as more data become available there may be separate hearing group designations for Very Low-Frequency cetaceans (blue, fin, right, and bowhead whales) and Mid-Frequency cetaceans (sperm, killer, and beaked whales). However, at this point, all baleen whales are part of the LF cetacean hearing group, and sperm, killer, and beaked whales are part of the HF cetacean hearing group. Additionally, recent data indicate that as more data become available for Monachinae seals, separate hearing group designations maybe appropriate for the two phocid subfamilies (Ruscher et al. 2021; Sills et al. 2021)

***** Represents the generalized hearing range for the entire group as a composite (i.e., all species within the group), where individual species' hearing ranges may not be as broad. Generalized hearing range chosen based on ~65 dB threshold from composite audiogram, previous analysis in NMFS 2018, and/or data from Southall et al. 2007; Southall et al. 2019. Additionally, animals can detect very loud sounds above and below that generalized hearing range.

+ NMFS is aware that the National Marine Mammal Foundation successfully collected preliminary hearing data on two minke whales during their third field season (2023) in Norway. These data have implications for not only the generalized hearing range for low-frequency cetaceans but also on their weighting function. However, at this time, no official results have been published. Furthermore, a fourth field season (2024) is proposed, where more data will likely be collected. Thus, it is premature for us to propose any changes to our current Updated Technical Guidance. However, mysticete hearing data is identified as a special circumstance that could merit re-evaluating the acoustic criteria in this document. Therefore, we anticipate that once the data from both field seasons are published, it will likely necessitate updating this document (i.e., likely after the data gathered in the summer 2024 field season and associated analysis are published).

In addition, NMFS uses the following thresholds for in-air sound pressure levels from broadband sounds that cause Level B behavioral disturbance under section 3(18)(A)(ii) of the MMPA (16 U.S.C. 1362(18)(A)(ii)):

- 100 dB_{rms} re 20μPa for non-harbor seal pinnipeds

Acoustic Disturbance

Vessel Noise

Vessel noise associated with the proposed action will include barges transporting construction materials and equipment to the hovercraft ramps at the Northeast Terminal and Cross Wind Cove. A total of 40 barge transits are expected over the course of two construction seasons, with approximately 10 barge landings at each site per year. Barges may travel to the action area from a number of ports, including Seattle, WA; Seward, Anchorage, Kodiak, and/or Dutch Harbor, AK. While most listed species considered for the proposed action may be found throughout much of the barge transit areas (e.g., open Gulf of Alaska), some species may only overlap with barges if they travel to certain ports. Specifically, if barges do not come from Seattle, WA, it is very unlikely that barges would overlap with Southern Resident killer whales, Central America DPS humpback whales, or their critical habitats described above. Similarly, if barges do not transit through Cook Inlet to Anchorage, AK, the chance of an overlap with Cook Inlet belugas is almost nonexistent and there would be no overlap with their critical habitat.

Vessels associated with the proposed action will have a transitory and short-term presence within the action area; the potential overlap with listed marine mammals is relatively small for the transit route(s) and even more so for the delivery to the hovercraft ramps due to their proximity to shore. Additionally, the slow speeds that the barges will be traveling (i.e., 8 knots per mitigation measure #1) reduces the noise produced by barges during transit. Even during peak occurrence in the summer and early fall seasons, only some of the marine mammals in the area are expected to be listed species (e.g., <1 percent for WNP DPS and approximately 11 percent for Mexico DPS humpback whales, and <1.6 percent for WNP DPS gray whales). Many of the cetacean species considered in this consultation and WDPS Steller sea lions routinely encounter transiting vessels and may also be habituated to associated noise in harbors (e.g., WDPS Steller sea lions, Cook Inlet belugas, Southern Resident killer whales). Sunflower sea stars are not expected to be impacted by vessel noise. For all listed and proposed species likely to be in the action area, we do not expect that the effects from vessel noise could be meaningfully measured or detected, and therefore we consider such effects to be insignificant.

Additional Activities: Road Construction Noise

If the land exchange is approved and road construction does occur, construction noise from the proposed road corridor could impact listed species. Potential construction noise may be generated from activities including clearing and grubbing, blading, and deposition of fill. As road construction would mostly be conducted on land and the sound generated would be in-air, the primary listed species likely to be close enough to the sound sources are WDPS Steller sea lions. Road construction activities would take place 0.5-1 miles from Kinzarof Lagoon, 0.7 miles from

Izembek Lagoon, and 1.7 miles from Moffet Lagoon. Steller sea lions have been observed utilizing these locations as habitat throughout the year.

Previous work has estimated that the ambient in-air sound levels in Izembek NWR range from 40–50 dBA (in-air) and from 50–60 dBA in Cold Bay, taking into account average wind speeds great than 15 miles per hour. Analysis from ADOT&PF (2020) estimated noise levels of 72.2 dBA at 200 feet from construction activities, and 58.5 dBA at 1,000 feet. Based on what is known of the local ambient sound levels, it is very unlikely that road construction noise would even be detected by WDPS Steller sea lions or other species that would be at least 0.5 mi away from construction activities.

Blasting may also occur during road construction, with short-term exposure to high intensity sound. This activity is expected to occur at the two material sites (Figure 2), which are 0.33 miles and 0.7 miles from Kinzarof and Izembek Lagoons, respectively. Data on in-air blasting noise suggests sound levels of 94 dBA at 50 feet (FHWA 2006), which is expected to dissipate to ambient in-air levels before reaching marine habitats where listed species may occur.

All in-air noise that could be produced by road construction activities including clearing, disposition of fill, and blasting is expected to dissipate to ambient levels or lower by the time it reaches the marine environments within the action area. The listed species most likely to be in the surrounding marine habitats are WDPS Steller sea lions as cetacean species are not known to utilize the lagoon areas. Therefore, we conclude the impacts from road construction noise on WDPS Steller sea lions and other listed species would be insignificant and discountable.

Additional Activities: Bridge Construction Noise

If the land exchange is approved and road construction does occur, a single large bridge would need to be installed over Southeast Kinzarof Stream, requiring pile driving. The location of the bridge is 1.3 miles northeast of Kinzarof Lagoon and more than 5 miles from Izembek Lagoon. The NMFS in-air threshold for otariids is 100 dB_{rms} re 20μPa. Data collected at several sites along the east coast of the United States indicate that in-air levels for pile driving are generally below 100 dBA within 15-30 meters (approximately 50-100ft) of the pile driving, for both impact and vibratory driving (NAVFAC SW 2017). Pile size and method of driving to be used for the proposed bridge installation are unknown at this time, but because of the distance between the pile driving activities and marine waters where listed species may be found (at least 1.3 miles), we conclude that the effects of acoustic disturbance from pile driving are extremely unlikely to occur, and if they do, the impacts will be insignificant.

Vessel Strike

Vessels transiting the marine environment have the potential to collide with, or strike, marine mammals (Laist et al. 2001; Jensen and Silber 2004). The probability of strike events depends on the frequency, speed, and route of the marine vessels, as well as distribution of marine mammals in the area. Humpback whales are especially susceptible to ship strike injury and mortality in narrow bottleneck passages (Williams and O'Hara 2010). Laist et al. (2001) found that while all sizes and types of vessels can strike a whale, ships greater than 80 meters and those going faster than 14 knots were most likely to cause severe or fatal injuries. Specifically, for vessels traveling at known speeds of 13 knots or greater resulted in 21 cases of minor or severe injury, or death, while vessels traveling below 13 knots result in five cases of minor or severe injury and one death (Laist et al. 2001). All of the cetaceans considered in this consultation are at risk of vessel strikes.

A temporary increase in tug and barge transits to the hovercraft ramps at the Northeast Terminal and Cross Wind Cove is expected to occur. However, increased barge traffic for the proposed project would only occur over two years during summer months, with 40 potential barge transits total. A slight increase in barge traffic is also expected along the marine transit routes (whichever are used). Because barges will be following the mitigation measures described above, including transiting at slow speeds (8 knots or less) and further reducing speed around whales (as safety allows), using established shipping lanes, and there will be limited number of barge transits in comparison to overall vessel traffic moving through the possible transit routes (e.g., Gulf of Alaska, Cook Inlet), we conclude that impacts of vessel strikes on ESA listed-marine mammals due to the proposed barge activity are very unlikely to occur.

If the land exchange is authorized and a road constructed, an overall increase in vessel traffic in the lagoons in the action area could occur subsequent to the completion of the road. There is currently no easy way for smaller vessels in King Cove to get into Izembek Lagoon for subsistence and recreational activities. The proposed road would open access to the lagoon, leading to increased vessel traffic, mostly of smaller vessels. WDPS Steller sea lions are the primary listed marine mammal that is likely to overlap with such increased vessel traffic. Sea lions, like most pinnipeds, are not as susceptible to vessel strikes compared to cetacean species. There are only four records of stranded Steller sea lions with injuries indicative of vessel strike in Alaska, three occurred in Sitka and one in Kachemak Bay (NMFS Alaska Regional Office Stranding Database accessed February 2023). As sea lions frequent the surrounding harbors in the action area, they may be habituated to vessel traffic and thus vessel strikes of WDPS Steller sea lions due to increased vessel traffic in the lagoon would be unlikely to occur.

Incidental Spills

Listed marine mammals could be exposed to incidental spills through project barges and road construction, should construction occur. Accidental spills could occur from a barge leak or onboard spill during transit or cargo delivery. The expected increase in vessel traffic in the lagoons could also lead to incidental spills. The size of the spill influences the number of individuals that will be exposed to spilled material and the duration of that exposure. Contact through the skin, eyes, or through inhalation and ingestion could result in temporary irritation or long-term endocrine or reproductive impacts, depending on the duration of exposure. The greatest threat to cetaceans is likely from the inhalation of the volatile toxic hydrocarbon fractions of fresh oil, which can damage the respiratory system (Hansen 1985; Neff 1990), cause neurological disorders or liver damage (Geraci and St. Aubin 1990), have anesthetic effects (Neff 1990), and cause death (Geraci and St. Aubin 1990). However, for small spills, such as those we would expect for this project, there is expected to be a rapid dissipation of toxic fumes into the atmosphere from rapid aging of fresh refined oil, which limits potential exposure of whales and Steller sea lions to prolonged inhalation of toxic fumes. We do not expect that sunflower sea stars would be affected by pollutants that are released and remain at the surface, or higher in the water column.

Based on the localized nature of incidental spills, the relatively rapid weathering and dispersion, and the safeguards expected to be in place to prevent spills from occurring (following industry standard BMPs and additional measures that the specific contractor implements), we conclude that exposure of listed species to an incidental spill is highly unlikely to occur, and should such exposure occur, its effects upon listed species will be so small as to be insignificant.

Analyzing Effects Upon Critical Habitat

Humpback Whale Critical Habitat

Critical habitat for the WNP, Central America, and Mexico DPS humpback whales was designated April 21, 2021 (86 FR 21082) (Fig. 3). Critical habitat for the WNP and Mexico DPSs include areas in the eastern Aleutian Islands, the Shumagin Islands, and around Kodiak Island and critical habitat for the Central America DPS includes the Strait of Juan de Fuca (50 CFR 226.227).

For all three DPSs considered in this consultation, prey species are the physical or biological features deemed necessary for the conservation of the species. The specific prey species for each DPS can be found in the description of species and critical habitat in the previous section.

Vessel noise from the proposed action is only expected to affect WNP, Central America, and Mexico DPS humpback whale prey within the immediate vicinity of the passing barge and these impacts would be short-lived, as the barges will be continuously moving. Prey reaction to this sound is expected to be no more than a brief startle response, with normal activity resuming once the sound has ceased. Therefore, we conclude that any effects of vessel noise from project barges on WNP, Central America, and Mexico DPS humpback whale critical habitat will be insignificant.

North Pacific Right Whale Critical Habitat

NMFS identified physical and biological features essential for conservation of the North Pacific right whale in the final rule to designate critical habitat (73 FR 19000; April 8, 2008). The physical or biological features deemed necessary for the conservation of North Pacific right whales include the presence of specific prey species in areas where physical and oceanographic conditions promote high productivity and prey aggregations.

The proposed project may impact North Pacific right whale critical habitat only if project barges transport construction materials along the southern coast of Kodiak Island, where one of the two critical habitat areas is located (Figure 4). Vessel noise from the proposed action is only expected to affect North Pacific right whale prey within the immediate vicinity of the passing barges and these impacts would be short-lived, as the barges will be continuously moving. Prey reaction to this sound is expected to be no more than a brief startle response, with normal activity resuming once the sound has ceased. Additionally, barges will only be in or near critical habitat if supplies are transported from Cook Inlet, and barges can easily avoid transiting through the critical habitat area. If avoidance is not possible due to unforeseen circumstances, such as weather patterns, even if barges do transit through critical habitat, mitigation measure # 4 further reduces the potential for impacts to North Pacific right whales and their critical habitat. Therefore, we conclude that any effects of vessel noise from project barges on North Pacific right whale critical habitat will be insignificant.

Cook Inlet Beluga Whale Critical Habitat

NMFS identified five physical and biological features essential for the conservation of Cook Inlet beluga whales (also known as primary constituent elements, or PCEs) in the final rule to designate critical habitat (76 FR 20180; April 11, 2011). The proposed project may impact Cook Inlet beluga whale critical habitat only if project vessels transport construction materials from Anchorage to the action area (Fig. 5). We evaluate effects to each of the physical and biological features (50 CFR 226.220(c)) below.

1. Intertidal and subtidal waters of Cook Inlet with depths <30 feet (MLLW) and within 5 miles of high and medium flow anadromous fish streams.

Project barges may travel to and from Anchorage to transport supplies for the potential construction of the road. Barges are not likely to be in depths <30 ft, and while they may transit past high and medium flow anadromous fish streams, they are not likely to be within 5 miles of the shore. If they do come within 5 miles of these streams, there may be impacts of vessel noise, but these impacts on the streams are expected to be insignificant.

2. Primary prey species consisting of four species of Pacific salmon (Chinook, sockeye, chum, and coho), Pacific eulachon, Pacific cod, walleye pollock, saffron cod, and yellowfin sole.

Transit of project barges through Cook Inlet is not expected to impact primary prey species for Cook Inlet belugas. Vessel noise may cause fish to abandon their habitat temporarily, but due to the relatively short time vessel noise may persist through an area, fish would likely return to that habitat shortly after vessel passage. Therefore, impacts to prey species from vessel noise are expected to be insignificant, if they are even detected at all.

3. Waters free of toxins or other agents of a type and amount harmful to Cook Inlet beluga whales.

Incidental spills from project barges may occur during transit. The amount of potential contaminants or pollutants that may be released during normal transit operations are expected to minimal. Based on the localized nature of incidental spills and the relatively rapid weathering and dispersion, we conclude that impacts of barge transit introducing harmful agents in the water are minimal and unlikely to occur.

4. Unrestricted passage within or between the critical habitat areas.

Barge transit through Cook Inlet is not expected to restrict passage of Cook Inlet belugas within or between critical habitat areas. Barge presence will be transitory and will not add to the overall sound levels that would deter beluga movement in Cook Inlet, which receives abundant vessel traffic. Therefore, the impacts of barge transit on passage between critical habitat areas are very unlikely to occur.

5. Waters with in-water noise below levels resulting in the abandonment of critical habitat areas by Cook Inlet beluga whales.

Cook Inlet receives regular vessel traffic, including barges similar to what will be used in the proposed project. The passage of up to 40 barges over two summers is not expected to change the overall soundscape in Cook Inlet beluga critical habitat, and therefore the impacts of in-water noise generated by project barges are insignificant.

Southern Resident Killer Whale Critical Habitat

On August 2, 2021, NMFS revised Southern Resident killer whale critical habitat which includes inland waters of Washington State for three specific marine areas of Puget Sound and surrounding waters, and six specific marine areas along the coasts of Washington, Oregon, and California that contain the physical or biological features essential to conservation of the species (86 FR 41668, August 2, 2021). The proposed project may impact Southern Resident killer whale critical habitat only if project vessel transit through these areas (Fig. 6). We evaluate the effects to each physical or biological feature below.

1. Water quality to support growth and development.

Incidental spills from project barges may occur during transit, potentially affecting local water quality. The amount of potential contaminants or pollutants that may be released during normal transit operations are expected to minimal. Based on the localized nature of incidental spills and the relatively rapid weathering and dispersion, we conclude that impacts of barge transit on water quality are minimal and unlikely to occur.

2. Prey species of sufficient quantity, quality, and availability to support individual growth, reproduction, and development, as well as overall population growth.

Project barges transiting through Southern Resident killer whale critical habitat are not expected to impact the quantity, quality, and availability of prey species. Vessel noise may cause fish to abandon their habitat temporarily, but due to the relatively short time vessel noise may persist through an area, fish would likely return to that habitat shortly after vessel passage. Project barges will be transiting in already busy shipping areas and will not change the overall level of underwater noise. Therefore, impacts to prey species from vessel noise are expected to be insignificant, if they are even detected at all.

3. Passage conditions to allow for migration, resting, and foraging.

Barge transit in and out of Seattle, WA is not expected to restrict passage of Southern Resident killer whales for migration, resting, and foraging. Barge presence will be transitory and will not add to the overall sound levels in the area. Therefore, the impacts of barge transit on passage conditions for migration, resting, and foraging is very unlikely to occur.

Steller Sea Lion Critical Habitat

NMFS identified physical and biological features essential for conservation of Steller sea lions in the final rule to designate critical habitat (58 FR 45269; August 27, 1993), including terrestrial, air, and aquatic habitats (as described at 50 CFR 226.202) that support reproduction, foraging, rest, and refuge. The proposed project may impact Steller sea lion critical habitat when project vessel transit through these areas (Fig. 7 & 8). We evaluate effects to each of the physical or biological features below.

1. Terrestrial zones that extend 3,000 feet (0.9 km) landward from each major haulout and major rookery in Alaska.

No landward part of the project will be located near a major haulout or rookery. Therefore, we conclude there will be no effect to this PBF.

2. Air zones that extend 3,000 feet (0.9 km) above the terrestrial zone of each major haulout and major rookery in Alaska.

No aerial work will be conducted in the vicinity of a rookery or haulout, thus there will be no effect on this PBF.

3. Aquatic zones that extend 3,000 feet (0.9 km) seaward of each major haulout and major rookery in Alaska that is east of 144^{o} W longitude.

No project barges will be transiting within 3,000 ft of haulouts or rookeries in Southeast Alaska, thus there will be no effect on this PBF.

4. Aquatic zones that extend 20 nm (37 km) seaward of each major haulout and major rookery in Alaska that is west of 144^{o} W longitude.

Barges transporting project supplies may transit by two Steller sea lion rookeries south of the action area, Clubbing Rocks North and Clubbing Rocks South, and possibly others depending on the origin of the vessels (to-be-determined once a contractor is hired). The potential for disturbance to sea lions foraging near the haul out will be short-term and transitory, and a maximum of 40 barge transits are expected over a two years period. We do not think that barge presence will create a substantial disturbance because they will be moving slowly and will be passing through, not loitering, in the aquatic zones. Therefore, we conclude that any effect to this PBF will be insignificant.

5. Three special aquatic foraging areas: the Shelikof Strait area, the Bogoslof area, and the Seguam Pass area, as specified at 50 CFR 226.202(c).

No part of the proposed project will take place in any of these special aquatic foraging areas. Therefore, we conclude there will be no effect to this PBF.

Conclusion

Based on this analysis, NMFS concurs with your determination that the proposed action may affect, but is not likely to adversely affect, the blue whale (*Balaenoptera musculus*), fin whale (*Balaenoptera physalus*), WNP, Central America, or Mexico DPS humpback whale (*Megaptera novaeangliae*) or their critical habitats, North Pacific right whale (*Eubalaena japonica*) or its critical habitat, sperm whale (*Physeter macrocephalus*), WNP DPS gray whale (*Eschrichtius* *robustus*), sei whale (*Balaenoptera borealis*), Eastern North Pacific Southern Resident killer whale (*Orcinus orca*) or its critical habitat, Cook Inlet beluga whale (*Delphinapterus leucas*) or its critical habitat, or WDPS Steller sea lion (*Eumetopias jubatus*) or its critical habitat. Additionally, we agree that the proposed action is not likely to adversely affect the sunflower sea star. Reinitiation of consultation is required where discretionary Federal involvement or control over the action has been retained or is authorized by law and if (1) take of listed species occurs, (2) new information reveals effects of the action that may affect listed species or critical habitat in a manner or to an extent not previously considered, (3) the action is subsequently modified in a manner that causes an effect to the listed species or critical habitat that was not considered in this concurrence letter, or (4) a new species is listed or critical habitat designated that may be affected by the identified action (50 CFR 402.16).

Please direct any questions regarding this letter to Jenna Malek at jenna.malek@noaa.gov, 907-271-1823, and to akr.prd.section7@noaa.gov.

Sincerely,

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References

AAAHTO. 2019. A Policy on Geometric Design of Highways and Streets "Green Book”. Prepared by American Association of State Highway and Transportation Officials, Washington, D.C.

ADOT&PF. 2005. Alaska Highway Pre-Construction Manual. Prepared by ADOT&PF, Juneau, AK.

ADOT&PF. 2020. SF 299 Application submitted under Alaska National Interests Lands Act. October 28, 2020.

ADOT&PF. 2021. King Cove Cold Bay Road Plan and Profile, Draft.

Allen, B. M., and R. P. Angliss. 2011. Alaska marine mammal stock assessments, 2010. U.S. Dept. of Commerce, National Oceanic and Atmospheric Administration, National Marine Fisheries Service, Alaska Fisheries Science Center, Seattle, WA, May 2011. NOAA Technical Memorandum NMFS-AFSC-223, 292 p.

Au, W. W. L. 2000. Hearing in whales and dolphins: An overview. Pages 1-42 *in* W. W. L. Au, A. N. Popper, and R. R. Fay, editors. Hearing by Whales and Dolphins. Springer-Verlag, New York.

Au, W. W. L., A. A. Pack, M. O. Lammers, L. M. Herman, M. H. Deakos, and K. Andrews. 2006. Acoustic properties of humpback whale songs. Journal of the Acoustical Society of America 120(2):1103-1110.

Balser, E. J. 2004. And then there were more: cloning by larvae of echinoderms. Pages 3–9 *in* T. Heinzeller, and J. H. Nebelsick, editors. Echinoderms: München. A. A. Balkema Publishers, Leiden, London, New York, Philadelphia, Singapore.

Ban, S., and A. W. Trites. 2007. Quantification of terrestrial haul-out and rookery characteristics of steller sea lions. Marine Mammal Science 23(3):496-507.

Barlow, J. 2016. Cetacean abundance in the California Current estimated from ship-based line-transect surveys in 1991–2014, 63.

Bosch, I., R. B. Rivkin, and S. P. Alexander. 1989. Asexual reproduction by oceanic planktotrophic echinoderm larvae. Nature 337:169–170.

Brower, A., A. Willoughby, and M. Ferguson. 2022. Distribution and relative abundance of bowhead whales and other marine mammals in the western Beaufort Sea, 2020. U.S. Dept. of Commerce, National Oceanic and Oceanic Administration, National Marine Fisheries Service, Alaska Fisheries Science Center, Seattle, WA, July 2022. NOAA Technical Memorandum NMFS-AFSC-439, 155 p.

Brower, A. A., J. T. Clarke, and M. C. Ferguson. 2018. Increased sightings of subArctic cetaceans in the eastern Chukchi Sea, 2008–2016: population recovery, response to climate change, or increased survey effort? Polar Biology 41(5):1033-1039.

Brownell Jr, R. L., T. Kasuya, and D. Weller. 2007. Entrapment of western gray whales in Japanese fishing gear: population threats, Paper SC/59/BRG38 presented to the International Whaling Commission Scientific Committee, Anchorage, AK, May 2007.

Burkanov, V. N., and T. R. Loughlin. 2005. Distribution and abundance of Steller sea lions, *Eumetopias jubatus*, on the Asian coast, 1720's-2005. Marine Fisheries Review 67(2):1-62.

Byrne, M. 2013. Chapter 5: Asteroid evolutionary developmental biology and ecology. Pages 51-58 *in* J. M. Lawrence, editor. Starfish: biology and ecology of the Asteroidea. The Johns Hopkins University Press, Baltimore, MD.

Calambokidis, J., and J. Barlow. 2013. Updated abundance estimates of blue and humpback whales off the US West Coast incorporating photo-identifications from 2010 and 2011., 8.

Calambokidis, J., and J. Barlow. 2020. Updated abundance estimates for blue and humpback whales along the US West Coast using data through 2018. U.S. Dept. of Commerce, National Oceanic and Atmospheric Administration, National Marine Fisheries Service, Southwest Fisheries Science Center, San Diego, CA, September 2020. NOAA Technical Memorandum NOAA-TM-NMFS-SWFSC-634.

Calkins, D. G. 1998. Prey of Steller sea lions in the Bering Sea. Biosphere conservation: for nature, wildlife, and humans 1(1):33-44.

Calkins, D. G., and E. Goodwin. 1988. Investigation of the declining sea lion population in the Gulf of Alaska. Alaska Dept. of Fish and Game, Anchorage, AK, August 1988, 76 p.

Call, K. A., and T. R. Loughlin. 2005. An ecological classification of Alaskan Steller sea lion (*Eumetopias jubatus*) rookeries: A tool for conservation/management. Fisheries Oceanography 14(Supplement 1):212-222.

Carder, D. A., and S. H. Ridgway. 1990. Auditory brainstem response in a neonatal sperm whale, *Physeter spp.* The Journal of the Acoustical Society of America 88(S4 (1990)).

Carretta, J. V., K. A. Forney, E. M. Oleson, D. W. Weller, A. R. Lang, J. Baker, M. M. Muto, B. Hanson, A. J. Orr, H. Huber, M. S. Lowry, J. Barlow, J. E. Moore, D. Lynch, L. Carswell, and R. L. B. Jr. 2020. U.S. Pacific marine mammal stock assessments: 2019. U.S. Dep. Commer., NOAA, NMFS, Southwest Fisheries Science Center, August 2020. NOAA Technical Memorandum NMFS-SWFSC-629.

Carretta, J. V., E. M. Oleson, K. A. Forney, M. M. Muto, D. W. Weller, A. R. Lang, J. Baker, B. Hanson, A. J. Orr, J. Barlow, J. E. Moore, and R. L. B. Jr. 2022. U.S. Pacific marine mammal stock assessments: 2021.

Castellote, M., V. A. Gill, C. Garner, A. Gilstad, B. Hou, A. Brewer, and J. Knoth. 2023. Using passive acoustics to identify a winter foraging refugia and quiet space for an endangered beluga population in Alaska. OCS Study BOEM 2024-002. Contract No.: M20PG00005.

Castellote, M., A. Mooney, R. Andrews, S. Deruiter, W.-J. Lee, M. Ferguson, and P. Wade. 2021. Beluga whale (*Delphinapterus leucas*) acoustic foraging behavior and applications for long term monitoring. PLoS One 16(11):e0260485.

Castellote, M., R. J. Small, M. Lammers, J. Jenniges, J. Mondragon, C. D. Garner, S. Atkinson, J. Delevaux, R. Graham, and D. Westerholt. 2020. Seasonal distribution and foraging occurrence of Cook Inlet beluga whales based on passive acoustic monitoring. Endangered Species Research 41:225-243.

Castellote, M., R. J. Small, M. O. Lammers, J. J. Jenniges, J. Mondragon, and S. Atkinson. 2016. Dual instrument passive acoustic monitoring of belugas in Cook Inlet, Alaska. Journal of the Acoustical Society of America 139(5):2697-2707.

Chia, F. S., and C. W. Walker. 1991. Ch. 5. Echinodermata: Asteroidea. Pages pp. 301–353 *in* A. C. Giese, J. S. Pearse, and V. B. Pearse, editors. Reproduction of Marine Invertebrates Vol. VI-Echinoderms and Lophophorates. Boxwood Press.

Clarke, J., A. Brower, M. Ferguson, A. Willoughby, and A. Rotrock. 2020. Distribution and relative abundance of marine mammals in the eastern Chukchi Sea, eastern and western Beaufort Sea, and Amundsen Gulf, 2019 annual report. U.S. Dept. of Interior, Bureau of Ocean Energy Management (BOEM), Alaska OCS Region, Anchorage, AK, June 2020. OCS Study BOEM 2020-027 prepared under Interagency Agreement M17PG00031 by the NOAA, Alaska Fisheries Science Center, Marine Mammal Laboratory.

Cooke, J. G. 2018. Abundance estimates for western North Pacific gray whales for use with stock structure hypotheses of the range-wide review of the population structure and status of North Pacific gray whales. IWC SC/67b/ASI, 15 p.

Cooke, J. G., D. W. Weller, A. L. Bradford, O. Sychenko, A. M. Burdin, A. R. Lang, and R. L. Brownell Jr. 2017. Population assessment update for Sakhalin gray whale, with reference to stock identity, Report of the International Whaling Commission, SC/67A/NH/11, 15-17 November 2017.

Crance, J. L., C. L. Berchok, and J. L. Keating. 2017. Gunshot call production by the North Pacific right whale *Eubalaena japonica* in the southeastern Bering Sea. Endangered Species Research 34:251-267.

Crance, J. L., C. L. Berchok, D. L. Wright, A. M. Brewer, and D. F. Woodrich. 2019. Song production by the North Pacific right whale, *Eubalaena japonica*. Journal of the Acoustical Society of America 145(6):3467-3479.

Crance, J. L., R. P. Goetz, and R. P. Angliss. 2022. Report for the Pacific Marine Assessment Program for Protected Species (PacMAPPS) 2021 field survey, Seattle, WA, February

2022. Report prepared by Alaska Fisheries Science Center and submitted to the U.S. Navy Marine Species Monitoring Program MIPR No. N00070-21-MP-0E115, 21 p.

Cranford, T. W., and P. Krysl. 2015. Fin whale sound reception mechanisms: skull vibration enables low-frequency hearing. PloS one 10(1):e0116222.

Croll, D. A., C. W. Clark, A. Acevedo, B. Tershy, S. Flores, J. Gedamke, and J. Urban. 2002. Only male fin whales sing loud songs. Nature 417:811.

Dahlheim, M. E., H. D. Fisher, and J. D. Schempp. 1984. Sound production by the gray whale and ambient noise levels in Laguna San Ignacio, Baja California Sur, Mexico. Pages 511-541 *in* The gray whale: *Eschrichtius robustus*. Elsevier.

Damon-Randall, K. 2023. Occurrence and Distribution of Eastern North Pacific and Western North Pacific Populations of Gray Whales in the North Pacific Ocean. Office of Protected Resources.

Diogou, N., D. M. Palacios, J. A. Nystuen, E. Papathanassiou, S. Katsanevakis, and H. Klinck. 2019. Sperm whale (*Physeter macrocephalus*) acoustic ecology at Ocean Station PAPA in the Gulf of Alaska–Part 2: oceanographic drivers of interannual variability. Deep Sea Research Part I: Oceanographic Research Papers 150:103044.

Eco49. 2022. ESA Section 7 Biological Assessment for fisheries research conducted and funded by the Alaska Fisheries Science Center and the International Halibut Commission. Eco49 Consulting, Contract analysis prepared for the National Marine Fisheries Service, Bend, OR, June 2022, 127 p.

Eguchi, T., A. R. Lang, and D. Weller. 2024. Abundance of eastern North Pacific gray whales 2023/2024. NOAA Technical Memorandum NMFS-SWFSC-695.

Erbe, C. 2002. Hearing abilities of baleen whales. Defense Research and Development Canada, Ottawa, Ontario, October 2002. DRDC Atlantic CR 2002-065.

Ezer, T., J. R. Ashford, C. M. Jones, B. A. Mahoney, and R. C. Hobbs. 2013. Physical–biological interactions in a subarctic estuary: How do environmental and physical factors impact the movement and survival of beluga whales in Cook Inlet, Alaska? Journal of Marine Systems 111:120-129.

Fearnbach, H., J. W. Durban, S. A. Mizroch, S. Barbeaux, and P. R. Wade. 2012. Winter observations of a group of female and immature sperm whales in the high-latitude waters near the Aleutian Islands, Alaska. Marine Biodiversity Records 5:e13.

FHWA. 2006. FHWA Roadway Construction Noise Model User's Guide. Final Report. Federal Highway Administration.

Forney, K. A., and R. L. Brownell Jr. 1996. Preliminary report of the 1994 Aleutian Island marine mammal survey. National Oceanic and Atmospheric Administration, National

Marine Fisheries Service, Southwest Fisheries Science Center, Paper SC/48/011, La Jolla, California, presented to the IWC Scientific Committee, June 1996 (unpublished).

Fritz, L., K. Sweeney, R. Towell, and T. Gelatt. 2016. Aerial and ship-based surveys of Steller sea lions (*Eumetopias jubatus*) conducted in Alaska in June-July 2013 through 2015, and an update on the status and trend of the Western Distinct Population segment in Alaska. U.S. Dept. of Commerce, National Oceanic and Atmospheric Administraiton, National Marine Fisheries Service, Alaska Fisheries Science Center, Seattle, WA, May 2016. NOAA Technical Memorandum NMFS-AFSC-321, 72 p.

Gende, S. M., and M. F. Sigler. 2006. Persistence of forage fish 'hot spots' and its association with foraging Steller sea lions (*Eumetopias jubatus*) southeast Alaska. Deep-Sea Research Part Ii-Topical Studies in Oceanography 53(3-4):432-441.

Geraci, J. R., and D. J. St. Aubin. 1990. Sea mammals and oil: confronting the risks. Academic Press, Inc., San Deigo, CA.

Goetz, K. T., R. A. Montgomery, J. M. Ver Hoef, R. C. Hobbs, and D. S. Johnson. 2012. Identifying essential summer habitat of the endangered beluga whale Delphinapterus leucas in Cook Inlet, Alaska. Endangered Species Research 16(2):135-147.

Goetz, K. T., K. E. W. Shelden, C. L. Sims, J. M. Waite, and P. R. Wade. 2023. Abundance of belugas (*Delphinapterus leucas*) in Cook Inlet, Alaska, June 2021 and June 2022. U.S. Dept. of Commerce, National Oceanic and Atmospheric Administration, National Marine Fisheries Service, Alaska Fisheries Science Center, Marine Mammal Laboratory, Seattle, WA, May 2023. AFSC Processed Report 2023-03, 47 p.

Goold, J. C., and S. E. Jones. 1995. Time and frequency domain characteristics of sperm whale clicks. Journal of the Acoustical Society of America 98(3):1279-91.

Gravem, S. A., W. N. Heady, V. R. Saccomanno, K. F. Alvstad, A. L. M. Gehman, T. N. Frierson, and S. L. Hamilton. 2021. *Pycnopodia helianthoides*. IUCN Red List of Threatened Species 2021:43 p.

Gregr, E. J., and A. W. Trites. 2001. Predictions of critical habitat for five whale species in the waters of coastal British Columbia. Canadian Journal of Fisheries & Aquatic Sciences 58:1265-1285.

Hakamada, T., K. Matsuoka, H. Murase, and T. Kitakado. 2017. Estimation of the abundance of the sei whale *Balaenoptera borealis* in the central and eastern North Pacific in summer using sighting data from 2010 to 2012. Fisheries Science 83:887-895.

Hanselman, D. H., B. J. Pyper, and M. J. Peterson. 2018. Sperm whale depredation on longline surveys and implications for the assessment of Alaska sablefish. Fisheries Research 200:75-83.

Hansen, D. J. 1985. The Potential Effects of Oil Spills and Other Chemical Pollutants on Marine Mammals Occurring in Alaskan Waters. USDOI, MMS, Alaska OCS Region, Anchorage, AK, 22.

Harwood, J. 2017. Sei whale. Pages 845-846 *in* B. Wursig, J. M. Thewissen, and K. M. Kovacs, editors. Encyclopedia of Marine Mammals. Elsevier Science & Technology.

Hastings, K. K., T. S. Gelatt, J. M. Maniscalco, L. A. Jemison, R. Towell, G. W. Pendleton, and D. S. Johnson. 2023. Reduced survival of Steller sea lions in the Gulf of Alaska following marine heatwave. Frontiers in Marine Science 10:1127013.

Hastings, K. K., L. A. Jemison, G. W. Pendleton, K. L. Raum-Suryan, and K. W. Pitcher. 2017. Natal and breeding philopatry of female Steller sea lions in southeastern Alaska. PLoS One 12(6):e0176840.

Hastings, K. K., M. J. Rehberg, G. M. O'Corry-Crowe, G. W. Pendleton, L. A. Jemison, and T. S. Gelatt. 2020. Demographic consequences and characteristics of recent population mixing and colonization in Steller sea lions, *Eumetopias jubatus*. Journal of Mammalogy 101(1):107-120.

Hatch, L. T., and C. W. Clark. 2004. Acoustic differentiation between fin whales in both the North Atlantic and North Pacific Oceans, and integration with genetic estimates of divergence, SC/56/SD6, Italy, 2004, 37.

Hemery, L. G., S. R. Marion, C. G. Romsos, A. L. Kurapov, and S. K. Henkel. 2016. Ecological niche and species distribution modelling of sea stars along the Pacific Northwest continental shelf. Diversity and Distributions 22(12):1314-1327.

Herrlinger, T. J. 1983. The diet and predator-prey relationships of the sea star *Pycnopodia helianthoides* (Brandt) from a central California kelp forest. Master's thesis. San Jose State University, Moss Landing Marine Laboratories, San Jose, CA, 57 p.

Holmes, E., and A. York. 2003. Using age structure to detect impacts on threatened populations: a case study with Steller sea lions. Conservation Biology 17(6):1794-1806.

Jemison, L. A., G. W. Pendleton, L. W. Fritz, K. K. Hastings, J. M. Maniscalco, A. W. Trites, and T. S. Gelatt. 2013. Inter-population movements of Steller sea lions in Alaska with implications for population separation. PloS one 8(8):e70167.

Jemison, L. A., G. W. Pendleton, K. K. Hastings, J. M. Maniscalco, and L. W. Fritz. 2018. Spatial distribution, movements, and geographic range of Steller sea lions (*Eumetopias jubatus*) in Alaska. PLoS One 13(12):e0208093.

Jensen, A. S., and G. K. Silber. 2004. Large whale ship strike database. U.S. Department of Commerce, National Oceanic and Atmospheric Administration, National Marine Fisheries Service, Office of Protected Resources, Silver Spring, MD, January 2004. NOAA Technical Memorandum NMFS-OPR-25, 37 p.

Jones, M. L., and S. L. Swartz. 2009. Gray whale: *Eschrichtius robustus*. Pages 503-511 *in* W. F. Perrin, B. Wursig, and J. G. M. Thewissen, editors. Encyclopedia of Marine Mammals, Second edition. Academic Press, San Diego.

Kennedy, A. S., D. R. Salden, and P. J. Clapham. 2012. First high- to low-latitude match of an eastern North Pacific right whale (*Eubalaena japonica*). Marine Mammal Science 28(4):E539-E544.

Kennedy, A. S., A. N. Zerbini, B. K. Rone, and P. J. Clapham. 2014. Individual variation in movements of satellite-tracked humpback whales Megaptera novaeangliae in the eastern Aleutian Islands and Bering Sea. Endangered Species Research 23(2):187-195.

Kenyon, K. W., and D. W. Rice. 1961. Abundance and distribution of the Steller sea lion. Journal of Mammalogy 42(2):223-234.

Koot, B. 2015. Winter behaviour and population structure of fin whales (*Balaenoptera physalus*) in British Columbia inferred from passive acoustic data. Masters. The University of British Columbia, Vancouver, 120.

Kumar, S. V., M. Castellote, and V. Gill. 2024. The urban beluga acoustic monitoring in the Kenai and Kasilof Rivers, Alaska, Anchorage. CS Study BOEM 2024-002. Contract No.: M20PG00005.

Laist, D. W., A. R. Knowlton, J. G. Mead, A. S. Collet, and M. Podesta. 2001. Collisions between ships and whales. Marine Mammal Science 17(1):35-75.

Lambert, P. 2000. Sea stars of British Columbia, Southeast Alaska and Puget Sound. UBC Press, Vancouver.

Lander, M. E., T. R. Loughlin, M. G. Logsdon, G. R. VanBlaricom, B. S. Fadely, and L. W. Fritz. 2009. Regional differences in the spatial and temporal heterogeneity of oceanographic habitat used by Steller sea lions. Ecological Applications 19(6):1645-59.

Leatherwood, S., R. R. Reeves, W. F. Perrin, W. E. Evans, and L. Hobbs. 1982. Whales, dolphins, and porpoises of the eastern North Pacific and adjacent Arctic waters: A guide to their identification. U.S. Dept. of Commerce, National Oceanic and Atmospheric Administration, National Marine Fisheries Service, National Marine Mammal Laboratory, Seattle, WA, July 1982. NOAA Technical Report NMFS Circular 444.

Loughlin, T. R., D. J. Rugh, and C. H. Fiscus. 1984. Northern sea lion distribution and abundance: 1956-80. Journal of Wildlife Management 48(3):729-740.

Loughlin, T. R., and A. E. York. 2000. An accounting of the sources of Steller sea lion, *Eumetopias jubatus*, mortality. Marine Fisheries Review 62(4):40-45.

Lowry, D., S. Wright, M. Neuman, D. Stevenson, J. Hyde, M. R. Lindeberg, N. Tolimieri, S. Lonhart, S. B. Traiger, and R. G. Gustafson. 2022. Endangered Species Act status review report: sunflower sea star (*Pycnopodia helianthoides*). U.S. Dept. of Commerce, National

Oceanic and Atmospheric Administration, National Marine Fisheries Service, Seattle, WA, October 2022. Final report to NMFS Office of Protected Resources, 89 p. + appendices.

Lundquist, C. J., and L. W. Botsford. 2011. Estimating larval production of a broadcast spawner: the influence of density, aggregation, and the fertilization Allee effect. Canadian Journal of Fisheries and Aquatic Sciences 68:30-42.

Martinez-Aguilar, S., J. Urban R., D. Weller, O. Y. Tyurneva, A. Bradford, A. Burdin, A. R. Lang, S. Swartz, O. Sychenko, L. Viloria-Gomora, V. Hernandez, and Y. M. Yakovlev. 2022. Gray whale (*Eschrichtius robustus*) migratory movements between the western North Pacific and the Mexican breeding grounds: 2022 update, Paper SC/68D/CMP/09 presented to the International Whaling Commission's Scientific Committee.

Mate, B. R., V. Y. Ilyashenko, A. L. Bradford, V. V. Vertyankin, G. A. Tsidulko, V. V. Rozhnov, and L. M. Irvine. 2015. Critically endangered western gray whales migrate to the eastern North Pacific. Biology Letters 11(4):20150071.

Matsuoka, K., J. L. Crance, J. K. D. Taylor, I. Yoshimura, A. James, and Y.-R. An. 2022. North Pacific right whale (Eubalaena japonica) sightings in the Gulf of Alaska and the Bering Sea during IWC-Pacific Ocean Whale and Ecosystem Research (IWC-POWER) surveys. Marine Mammal Science 38(2):822-834.

Matsuoka, K., S. A. Mizroch, and H. Komiya. 2013. Cruise report of the 2012 IWC-Pacific Ocean Whale and Ecosystem Research (IWC-POWER). International Whaling Commission, Cambridge, 43 p.

Mauzey, K. P., C. Birkeland, and P. K. Dayton. 1968. Feeding behavior of asteroids and escape responses of their prey in the Puget Sound region. Ecology 49(4):603-619.

McGuire, T. L., G. K. Himes Boor, J. R. McClung, A. D. Stephens, C. Garner, K. E. W. Shelden, and B. Wright. 2020. Distribution and habitat use by endangered Cook Inlet beluga whales: Patterns observed during a photo-identification study, 2005–2017. Aquatic Conservation: Marine and Freshwater Ecosystems 30(12):2402-2427.

Mellinger, D. K., K. M. Stafford, and C. G. Fox. 2004. Seasonal occurrence of sperm whale (*Physeter macrocephalus*) sounds in the Gulf of Alaska, 1999–2001. Marine Mammal Science 20(1):48-62.

Merrick, R. L., and T. R. Loughlin. 1997. Foraging behavior of adult female and young-of-the-year Steller sea lions in Alaskan waters. Canadian Journal of Zoology 75(5):776-786.

Miller, P. J. O., M. P. Johnson, and P. Tyack. 2004. Sperm whale behaviour indicates the use of echolocation click buzzes 'creaks' in prey capture. Proceedings of the Royal Society of London. Series B: Biological Sciences 271:2239-2247.

Mizroch, S., and D. Rice. 2013. Ocean nomads: Distribution and movements of sperm whales in the North Pacific shown by whaling data and Discovery marks. Marine Mammal Science 29:E136-E165.

Mizroch, S. A., D. W. Rice, D. Zwiefelhofer, J. Waite, and W. L. Perryman. 2009. Distribution and movements of fin whales in the North Pacific Ocean. Mammal Review 39(3):193-227.

Møhl, B., M. Wahlberg, P. T. Madsen, A. Heerfordt, and A. Lund. 2003. The monopulsed nature of sperm whale clicks. The Journal of the Acoustical Society of America 114(2):1143-1154.

Monnahan, C. C., T. A. Branch, K. M. Stafford, Y. V. Ivashchenko, and E. M. Oleson. 2014. Estimating historical eastern North Pacific blue whale catches using spatial calling patterns. PloS one 9(6):e98974.

Moore, S. E., K. E. Shelden, L. K. Litzky, B. A. Mahoney, and D. J. Rugh. 2000. Beluga, *Delphinapterus leucas*, habitat associations in Cook Inlet, Alaska. Marine Fisheries Review 62(3):60-80.

Moore, S. E., K. M. Stafford, D. K. Mellinger, and J. A. Hildebrand. 2006. Listening for large whales in the offshore waters of Alaska. Bioscience 56(1):49-55.

Muto, M. M., V. T. Helker, B. J. Delean, N. C. Young, J. C. Freed, R. P. Angliss, N. A. Friday, P. L. Boveng, J. M. Breiwick, B. M. Brost, M. F. Cameron, P. J. Clapham, J. L. Crance, S. P. Dahle, M. E. Dahlheim, B. S. Fadely, M. C. Ferguson, L. W. Fritz, K. T. Goetz, R. C. Hobbs, Y. V. Ivashchenko, A. S. Kennedy, J. M. London, S. A. Mizroch, R. R. Ream, E. L. Richmond, K. E. W. Shelden, K. L. Sweeney, R. G. Towell, P. R. Wade, J. M. Waite, and A. N. Zerbini. 2022. Alaska marine mammal stock assessments, 2021. U.S. Dept. of Commerce, National Oceanic and Atmospheric Administration, National Marine Fisheries Service, Alaska Fisheries Science Center, Seattle, WA, August 2022. NOAA Technical Memorandum NMFS-AFSC-441, 398 p.

NAVFAC SW. 2017. Monitoring report for fuel pier replacement project (P-151) Naval Base Point Loma, San Diego, CA 8 October 2016 to 30 April 2017, 182.

Neff, J. M. 1990. Effects of oil on marine mammal populations: model simulations. Pages 35-54 *in* J. R. Geraci, and D. J. St. Aubin, editors. Sea Mammals and Oil: Confronting the Risks. Academic Press, New York.

Nelson, M. A., L. T. Quakenbush, B. A. Mahoney, B. D. Taras, and M. J. Wooller. 2018. Fifty years of Cook Inlet beluga whale feeding ecology from isotopes in bone and teeth. Endangered Species Research 36:77-87.

NMFS. 1998. Recovery plan for the blue whale (*Balaenoptera musculus*). U.S. Dept. of Commerce, National Oceanic and Atmospheric Administration, National Marine Fisheries Service, Office of Protected Resources, Silver Spring, MD, 42 p.

NMFS. 2008a. Conservation plan for the Cook Inlet beluga whale (*Delphinapterus leucas*). U.S. Department of Commerce, National Oceanic and Atmospheric Administration, National Marine Fisheries Service Alaska Region, Protected Resources Division, Juneau, AK, October 2008, 122 p.

NMFS. 2008b. Recovery plan for the Steller sea lion (*Eumetopias jubatus*). Eastern and Western Distinct Population Segments (*Eumetopias jubatus*). Revision. U.S. Dept. of Commerce, National Oceanic and Atmospheric Administration, National Marine Fisheries Service, Silver Spring, MD, March 2008, 325 p.

NMFS. 2010a. Final recovery plan for the fin whale (*Balaenoptera physalus*). U.S. Dept. of Commerce, NOAA, National Marine Fisheries Service, Office of Protected Resources, Silver Spring, MD, July 2010, 121 p.

NMFS. 2010b. Final recovery plan for the sperm whale (*Physeter macrocephalus*). U.S. Dept. of Commerce, National Oceanic and Atmospheric Administration, National Marine Fisheries Service, Office of Protected Resources, Silver Spring, MD, December 2010, 165 p.

NMFS. 2016. Recovery plan for the Cook Inlet beluga whale (*Delphinapterus leucas*). U.S. Dept. of Commerce, National Oceanic and Atmospheric Administration, National Marine Fisheries Service, Alaska Region, Protected Resources Division, Juneau, AK, December 2016.

NMFS. 2021. Occurrence of Endangered Species Act (ESA) listed humpback whales off Alaska. U.S. Dept. of Commerce, National Oceanic and Atmospheric Administration, National Marine Fisheries Service, Alaska Region Protected Resources Division, Juneau, AK, Revised August 6, 2021. Internal guidance document.

NMFS. 2022a. New Photos May Be First Visual Evidence Of North Pacific Right Whales Feeding In Bering Sea In Winter. NMFS, https://www.fisheries.noaa.gov/feature-story/new-photos-may-be-first-visual-evidence-north-pacific-right-whales-feeding-bering-sea.

NMFS. 2022b. Southern Resident Killer Whales (Orcinus orca) 5-Year Review: Summary and Evaluation. NOAA Fisheries.

NMFS. 2023. Gray whale, Western North Pacific Distinct Population Segment (*Eschrichtius robustus*) 5-year review: summary and evaluation. U.S. Department of Commerce, National Oceanic and Atmospheric Administration, National Marine Fisheries Service, Office of Protected Resources, Silver Spring, MD, 42 p.

NMFS. 2024. 2024 update to: Technical guidance for assessing the effects of anthropogenic sound on marine mammal hearing (Version 3.0). Underwater and in-air criteria for onset of auditory injury and temporary threshold shifts. U.S. Dept of Commerce, National Oceanic and Atmospheric Administration, National Marine Fisheries Service, Office of Protected Resources, Sliver Spring, MD, October 2024. NOAA Technical Memorandum NMFS-OPR-71, 182 p.

Oliver, J. S., and P. N. Slattery. 1985. Destruction and opportunity on the sea floor: effects of gray whale feeding. Ecology 66(6):1965-1975.

Omura, H. 1988. Distribution and migration of the western Pacific stock of the gray whale (*Eschrichtius robustus*). Scientific Reports of the Whales Research Institute 39:1-10.

Parks, S. E., D. R. Ketten, J. T. O'Malley, and J. Arruda. 2007. Anatomical predictions of hearing in the North Atlantic right whale. The Anatomical Record: Advances in Integrative Anatomy and Evolutionary Biology 290(6):734-744.

Paul, A. J., and H. M. Feder. 1975. The food of the sea star *Pycnopodia helianthoides* (Brandt) in Prince William Sound, Alaska. Ophelia 14:15-22.

Petrochenko, S. P., A. S. Potopov, and V. V. Pryadko. 1991. Sounds, source levels, and behavior of gray whales in the Chukotskoe Sea. Soviet Physics Acoustics 37:1189-1193.

Pitcher, K. W., and D. G. Calkins. 1981. Reproductive biology of Steller sea lions in the Gulf of Alaska. Journal of Mammalogy 62(3):599-605.

Pitcher, K. W., and F. H. Fay. 1982. Feeding by Steller sea lions on harbor seals. The Murrelet:70-71.

Posdaljian, N., A. Solsona-Berga, J. Hildebrand, C. Soderstjerna, S. M. Wiggins, K. Lenssen, and S. Baumann-Pickering. 2023. Sperm whales demographics in the Gulf of Alaska and Bering Sea/Aleutian Islands: an overlooked female habitat.

Posdaljian, N., A. Solsona-Berga, J. A. Hildebrand, C. Soderstjerna, S. M. Wiggins, K. Lenssen, and S. Baumann-Pickering. 2024. Sperm whale demographics in the Gulf of Alaska and Bering Sea/Aleutian Islands: An overlooked female habitat. PLoS One 19(7).

Quakenbush, L. T., R. S. Suydam, A. L. Bryan, L. F. Lowry, K. J. Frost, and B. A. Mahoney. 2015. Diet of beluga whales (*Delphinapterus leucas*) in Alaska from stomach contents, March–November. Marine Fisheries Review 77:70-84.

Raum-Suryan, K. L., K. W. Pitcher, D. G. Calkins, J. L. Sease, and T. R. Loughlin. 2002. Dispersal, rookery fidelity, and metapopulation structure of Steller sea lions (*Eumetopias jubatus*) in an increasing and a decreasing population in Alaska. Marine Mammal Science 18(3):746-764.

Raum-Suryan, K. L., M. J. Rehberg, G. W. Pendleton, K. W. Pitcher, and T. S. Gelatt. 2004. Development of dispersal, movement patterns, and haul-out use by pup and juvenile Steller sea lions (Eumetopias jubatus) in Alaska. Marine Mammal Science 20(4):823-850.

Rendell, L., and H. Whitehead. 2004. Do sperm whales share coda vocalizations? Insights into coda usage from acoustic size measurement. Animal Behaviour 67:865-874.

Rice, A. C., N. Posdaljian, M. A. Rafter, J. S. Trickey, S. M. Wiggins, S. Baumann-Pickering, and J. A. Hildebrand. 2020. Passive acoustic monitoring for marine mammals in the Gulf of Alaska Temporary Maritime Activities Area September 2017 to September 2019. Marine Physical Laboratory, Scripps Institution of Oceanography, University of California San Diego, La Jolla, CA. Technical Memorandum #646 under Cooperative Ecosystems Study Unit Cooperative Agreement N62473-18-2-0016 for U.S. Navy, U.S. Pacific Fleet, Pearl Harbor, HI.

Rice, A. C., A. Širović, J. S. Trickey, A. J. Debich, R. S. Gottlieb, S. M. Wiggins, J. A. Hildebrand, and S. Baumann-Pickering. 2021. Cetacean occurrence in the Gulf of Alaska from long-term passive acoustic monitoring. Marine Biology 168:72.

Rice, D. W. 1989. Sperm whale *Physeter macrocephalus* Linnaeus, 1758. Pages 177-233 *in* S. Ridgway, and R. Harrison, editors. Handbook of marine mammals, 4. Academic Press, New York, New York.

Richardson, W. J., C. R. Greene Jr, C. I. Malme, and D. H. Thomson. 1995. Marine mammals and noise. Academic Press, Inc., San Diego, CA.

Rone, B. K., A. N. Zerbini, A. B. Douglas, D. W. Weller, and P. J. Clapham. 2017. Abundance and distribution of cetaceans in the Gulf of Alaska. Marine Biology 164:23.

Shelden, K. E., K. T. Goetz, R. C. Hobbs, L. K. Hoberecht, K. L. Laidre, B. A. Mahoney, T. L. McGuire, S. Norman, G. O'Corry-Crowe, D. Vos, K. A. Burek-Huntington, and C. Garner. 2018. Beluga whale, *Delphinapterus leucas*, satellite-tagging and health assessments in Cook Inlet, Alaska, 1999 to 2002. U.S. Dept. of Commerce, National Oceanic and Atmospheric Administration, National Marine Fisheries Service, Alaska Fisheries Science Center, Seattle, WA, February 2018. NOAA Technical Memorandum NMFS-AFSC-369, 227 p.

Shelden, K. E. W., K. T. Goetz, D. J. Rugh, D. G. Calkins, B. A. Mahoney, and R. C. Hobbs. 2015. Spatio-temporal changes in beluga whale, *Delphinapterus leucas,* distribution: results from aerial surveys (1977-2014), opportunistic sightings (1975-2014), and satellite tagging (1999-2003) in Cook Inlet, Alaska. Marine Fisheries Review 77(2):1-32.

Shelden, K. E. W., and P. R. Wade. 2019. Aerial surveys, distribution, abundance, and trend of belugas (*Delphinapterus leucas*) in Cook Inlet, Alaska, June 2018. U.S. Dept. of Commerce, National Oceanic and Atmospheric Administration, National Marine Fisheries Service, Alaska Fisheries Science Center, Seattle, WA, December 2019. AFSC Processed Report 2019-09, 93 p.

Sigler, M. F., S. M. Gende, and D. J. Csepp. 2017. Association of foraging Steller sea lions with persistent prey hot spots in southeast Alaska. Marine Ecology Progress Series 571:233-243.

Sigler, M. F., D. J. Tollit, J. J. Vollenweider, J. F. Thedinga, D. J. Csepp, J. N. Womble, M. A. Wong, M. J. Rehberg, and A. W. Trites. 2009. Steller sea lion foraging response to seasonal changes in prey availability. Marine Ecology Progress Series 388:243-261.

Silber, G. K. 1986. The relationship of social vocalizations to surface behavior and aggression in the Hawaiian humpback whale (*Megaptera novaeangliae*). Canadian Journal of Zoology 64(10):2075-2080.

Sinclair, E., D. S. Johnson, T. K. Zeppelin, and T. S. Gelatt. 2013. Decadal variation in the diet of Western Stock Steller sea lions (*Eumetopias jubatus*). NMFS-AFSC-248.

Širović, A., L. N. Williams, S. M. Kerosky, S. M. Wiggins, and J. A. Hildebrand. 2013. Temporal separation of two fin whale call types across the eastern North Pacific. Marine Biology 160(1):47-57.

Straley, J. M., G. Schorr, A. Thode, J. Calambokidis, C. Lunsford, E. M. Chenoweth, V. O. Connell, and R. Andrews. 2014. Depredating sperm whales in the Gulf of Alaska: local habitat use and long distance movements across putative population boundaries. Endangered Species Research 24(2):125-135.

Strathmann, M. F. 1987. Phylum Echinodermata. Class Asteroidea. Pages 535-555 *in* M. F. Strathmann, editor. Reproduction and development of marine invertebrates of the northern Pacific Coast. Univ. of Washington Press, Seattle, WA.

Suryan, R. M., M. L. Arimitsu, H. A. Coletti, R. R. Hopcroft, M. R. Lindeberg, S. J. Barbeaux, S. D. Batten, W. J. Burt, M. A. Bishop, J. L. Bodkin, R. Brenner, R. W. Campbell, D. A. Cushing, S. L. Danielson, M. W. Dorn, B. Drummond, D. Esler, T. Gelatt, D. H. Hanselman, S. A. Hatch, S. Haught, K. Holderied, K. Iken, D. B. Irons, A. B. Kettle, D. G. Kimmel, B. Konar, K. J. Kuletz, B. J. Laurel, J. M. Maniscalco, C. Matkin, C. A. E. McKinstry, D. H. Monson, J. R. Moran, D. Olsen, W. A. Palsson, W. S. Pegau, J. F. Piatt, L. A. Rogers, N. A. Rojek, A. Schaefer, I. B. Spies, J. M. Straley, S. L. Strom, K. L. Sweeney, M. Szymkowiak, B. P. Weitzman, E. M. Yasumiishi, and S. G. Zador. 2021. Ecosystem response persists after a prolonged marine heatwave. Scientific Reports 11(1):6235.

Sweeney, K. L., B. Birkemeier, K. Luxa, and T. Gelatt. 2023. Results of the Steller sea lion surveys in Alaska, June–July 2023. U.S. Dept. of Commerce, National Oceanic and Atmospheric Administration, National Marine Fisheries Service, Alaska Fisheries Science Center, Marine Mammal Laboratory, Alaska Ecosystem Program, Seattle, WA, December 2023. AFSC Processed Report 2023-08, 36 p.

Thomson, D. H., and W. J. Richardson. 1995. Marine mammal sounds. W. J. Richardson, J. C. R. Greene, C. I. Malme, and D. H. Thomson, editors. Marine Mammals and Noise. Academic Press, San Diego, California.

Tillman, M. F. 1977. Estimates of population size for the North Pacific sei whale. Report of the International Whaling Commission Special Issue 1:98-106.

Tollit, D., L. Fritz, R. Joy, K. Miller, A. Schulze, J. Thomason, W. Walker, T. Zeppelin, and T. Gelatt. 2017. Diet of endangered Steller sea lions (*Eumetopias jubatus*) in the Aleutian Islands: new insights from DNA detections and bioenergetic reconstructions. Canadian Journal of Zoology 95(11):853-868.

Trites, A. W., B. P. Porter, V. B. Deecke, A. P. Coombs, M. L. Marcotte, and D. A. Rosen. 2006. Insights into the timing of weaning and the attendance patterns of lactating Steller sea lions (*Eumetopias jubatus*) in Alaska during winter, spring, and summer. Aquatic Mammals 32(1):85.

Urban R., J., D. Weller, S. Martinez A., O. Y. Tyurneva, A. Bradford, A. Burdin, A. R. Lang, S. Swartz, O. Sychenko, L. Viloria-Gomora, and Y. M. Yakovlev. 2019. New information on the gray whale migratory movements between the western and eastern North Pacific, Paper SC/68a/CMP11 presented to the International Whaling Commission's Scientific Committee.

USFWS. 2025. Request for Initiation of Informal Consultation under section 7(a)(2) of the Endangered Species Act (ESA) for the 2025 Proposed Izembek Land Exchange and Road Corridor. Prepared by AECOM Technical Services, Inc., for US Fish and Wildlife Service, for NOAA Fisheries, Anchorage, Alaska.

Vu, E. T., D. Risch, C. W. Clark, S. Gaylord, L. T. Hatch, M. A. Thompson, D. N. Wiley, and S. M. Van Parijs. 2012. Humpback whale song occurs extensively on feeding grounds in the western North Atlantic Ocean. Aquatic Biology 14(2):175-183.

Wade, P., M. P. Heide-Jørgensen, K. Shelden, J. Barlow, J. Carretta, J. Durban, R. LeDuc, L. Munger, S. Rankin, A. Sauter, and C. Stinchcomb. 2006. Acoustic detection and satellite-tracking leads to discovery of rare concentration of endangered North Pacific right whales. Biology Letters 2(3):417-419.

Wade, P. R. 2021. Estimates of abundance and migratory destination for North Pacific humpback whales in both summer feeding areas and winter mating and calving areas, NMFS Alaska Fisheries Science Center, Seattle, WA. Paper submitted to the International Whaling Commission SC/68C/IA/03.

Watkins, W. A. 1981. Activities and underwater sounds of fin whales. Scientific Reports of the Whales Research Institute 33:83-117.

Watkins, W. A., P. Tyack, K. E. Moore, and J. E. Bird. 1987. The 20-Hz signals of finback whales (*Balaenoptera physalus*). The Journal of the Acoustical Society of America 82(6):1901-1912.

Weilgart, L., and H. Whitehead. 1993. Coda communication by sperm whales (*Physeter macrocephalus*) off the Galapagos Islands. Canadian Journal of Zoology 71(4):744-752.

Weir, C. R., and J. C. Goold. 2007. The burst-pulse nature of 'squeal' sounds emitted by sperm whales (*Physeter macrocephalus*). Marine Biological Association of the United Kingdom. Journal of the Marine Biological Association of the United Kingdom 87(1):39.

Weller, D., and R. L. Brownell Jr. 2012. A re-evaluation of gray whale records in the western North Pacific, Paper SC/64/BRG10 submitted to the International Whaling Commission Scientific Committee, Panama, June 2012.

Weller, D. W., A. Klimek, A. L. Bradford, J. Calambokidis, A. R. Lang, B. Gisborne, A. M. Burdin, W. Szaniszlo, J. Urban, A. G.-G. Unzueta, S. Swartz, and R. L. Brownell Jr. 2012. Movements of gray whales between the western and eastern North Pacific. Endangered Species Research 18(2):193-199.

Weller, D. W., N. Takanawa, H. Ohizumi, N. Funahashi, O. A. Sychenko, A. M. Burdin, A. R. Lang, and R. L. Brownell Jr. 2015. Photographic match of a western gray whale between Sakhalin Island, Russia, and the Pacific coast of Japan, Paper SC/66a/BRG/17 presented to the International Whaling Commission Scientific Committee.

Weller, D. W., N. Takanawa, H. Ohizumi, N. Funahashi, O. A. Sychenko, A. M. Burdin, A. R. Lang, and R. L. Brownell Jr. 2016. Gray whale migration in the western North Pacific: further support for a Russia-Japan connection, WGWAP-17/INF.8, Annex F to SC/66b/BRG16 report of the IWC Scientific Committee, Bled, Slovenia, 11-13 November 2016.

Whitehead, H. 2003. Sperm whales: social evolution in the ocean. University of Chicago Press. 464 p.

Whitehead, H., and L. Weilgart. 1991. Patterns of visually observable behaviour and vocalizations in groups of female sperm whales. Behaviour 118:275-296.

Wieting, D. S. 2016. Interim Guidance on the Endangered Species Act Term "Harass". U.S. Dept. of Commerce, NOAA, NMFS, Office of Protected Resources, Silver Spring, MD, October 21, 2016. Memorandum from the Director of the NMFS Office of Protected Resources to NMFS Regional Administrators.

Wiggins, S. M., and J. A. Hildebrand. 2020. Fin whale 40-Hz calling behavior studied with an acoustic tracking array. Marine Mammal Science 36:964-971.

Wild, L., A. Thode, J. Straley, S. Rhoads, D. Falvey, and J. Liddle. 2017. Field trials of an acoustic decoy to attract sperm whales away from commercial longline fishing vessels in western Gulf of Alaska. Fisheries Research 196:141-150.

Williams, R., and P. O'Hara. 2010. Modelling ship strike risk to fin, humpback and killer whales in British Columbia, Canada. Journal of Cetacean Research and Management 11(1):1-8.

Witteveen, B. H., and K. M. Wynne. 2017. Site fidelity and movement of humpback whales (*Megaptera novaeangliae*) in the western Gulf of Alaska as revealed by photo-identification. Canadian Journal of Zoology 95(3):169-175.

Womble, J. N., M. F. Sigler, and M. F. Willson. 2009. Linking seasonal distribution patterns with prey availability in a central-place forager, the Steller sea lion. Journal of Biogeography 36(3):439-451.

Wright, D., M. Castellote, C. L. Berchok, J. L. Crance, and P. J. Clapham. 2018a. Acoustic detection of North Pacific right whales in a high-traffic Aleutian Pass, 2009–2015. Endangered Species Research 37:77-90.

Wright, D., M. Castellote, C. L. Berchok, J. L. Crance, and P. J. Clapham. 2018b. Acoustic detection of North Pacific right whales in a high-traffic Aleutian Pass, 2009–2015. Endangered Species Research 37.

Wright, D. L. 2016. Passive acoustic monitoring of the critically endangered eastern North Pacific right whale (*Eubalaena japonica*), Final report to the Marine Mammal Commission, 56 p.

Wright, D. L., C. L. Berchok, J. L. Crance, and P. J. Clapham. 2019. Acoustic detection of the critically endangered North Pacific right whale in the Northern Bering Sea. Marine Mammal Science 35(1):311-326.

York, A. E. 1994. The population dynamics of northern sea lions, 1975-1985. Marine Mammal Science 10(1):38-51.

Young, N. C., M. M. Muto, V. T. Helker, B. J. Delean, J. C. Freed, R. P. Angliss, N. A. Friday, P. L. Boveng, J. M. Breiwick, B. M. Brost, M. F. Cameron, P. J. Clapham, J. L. Crance, S. P. Dahle, M. E. Dahlheim, B. S. Fadely, M. C. Ferguson, L. W. Fritz, K. T. Goetz, R. C. Hobbs, Y. V. Ivashchenko, A. S. Kennedy, J. M. London, S. A. Mizroch, R. R. Ream, E. L. Richmond, K. E. W. Shelden, K. L. Sweeney, R. G. Towell, P. R. Wade, J. M. Waite, and A. N. Zerbini. 2023. Alaska marine mammal stock assessments, 2022. U.S. Dept. of Commerce, National Oceanic and Atmospheric Administration, National Marine Fisheries Service, Alaska Fisheries Science Center, Seattle, WA, July 2023. NOAA Technical Memorandum NMFS-AFSC-474, 316 p.

Zerbini, A., M. Baumgartner, A. Kennedy, B. Rone, P. R. Wade, and P. J. Clapham. 2015. Space use patterns of the endangered North Pacific right whale *Eubalaena japonica* in the Bering Sea. Marine Ecology Progress Series 532:269-281.

Zimmer, W. M. X., P. Tyack, M. Johnson, and P. T. Madsen. 2005. Three-dimensional beam pattern of regular sperm whale clicks confirms bent-horn hypothesis. The Journal of the Acoustical Society of America 117(3):1473-1485.

Programmatic Agreement Among
The U.S. Army Corps of Engineers, Alaska District;; and
The Alaska State Historic Preservation Officer;
Regarding the King Cove to Cold Bay Road Project
POA-2010-00286, Kinzarof Lagoon, Alaska

July 7, 2026

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Programmatic Agreement

WHEREAS, the U.S. Army Corps of Engineers, Alaska District (USACE) is evaluating an application for a Department of the Army permit under POA-2010-00286, Kinzarof Lagoon, for the discharge of fill material into wetlands and other Waters of the United States for construction of the King Cove to Cold Bay Road Project (Project) by the Alaska Department of Transportation and Public Facilities (DOT&PF); and

WHEREAS, the issuance of a Department of the Army permit is an undertaking as defined at 36 CFR 800.16(y), and USACE is the federal agency responsible for compliance with Section 106 of the National Historic Preservation Act (NHPA), 54 USC § 306108, and its implementing regulations at 36 CFR Part 800; and

WHEREAS, the Project would construct approximately 19 miles of single-lane gravel road between the communities of King Cove and Cold Bay, including a 13-foot-wide travel way with intervisible turnouts, culverts or pipe arches for stream crossings, one bridge of approximately 150 feet, and two material sites; and

WHEREAS, DOT&PF has been designated as the non-federal representative for purposes of assisting USACE with Section 106 compliance for the undertaking, consistent with 36 CFR 800.2(a)(3); and

WHEREAS, USACE has consulted with the Alaska State Historic Preservation Officer (SHPO) and the consulting parties pursuant to 36 CFR Part 800 and determined that a programmatic agreement (Agreement) is appropriate pursuant to 36 CFR 800.14(b) to govern phased identification, evaluation, treatment, monitoring, reporting, and resolution of adverse effects for the undertaking as access, permitting, design, and schedule constraints prevented complete identification and evaluation before issuing a permit; and

WHEREAS, USACE, in consultation with SHPO and consulting parties, has defined the permit area to include the project area identified in the permit application materials, the direct construction areas, the right-of-way obtained for the Project, and a buffer generally extending between 100 and 200 feet outside the right-of-way to account for potential visual, aesthetic, vibratory, noise, dust, and proximity effects (Appendix A); and

WHEREAS, the permit area for the King Cove to Cold Bay Road Project is co-extensive with the Area of Potential Effects (APE) (Appendix A); and

WHEREAS, DOT&PF, in coordination with USACE, is performing a phased and good-faith effort to identify historic properties within the APE, including desktop review, review of Alaska Heritage Resources Survey (AHRS) data, review of prior cultural resources studies and maps, analysis of historical aerial photography and topographic maps, and review of relevant archaeological, ethnographic, and historical literature;

WHEREAS, a Phase I cultural resources survey was conducted between August 5 and August 11, 2025, by qualified cultural resources professionals meeting the Secretary of the Interior Professional Qualification Standards, and

WHEREAS, the 2025 field effort relocated and field-verified three previously recorded historic properties within the APE: XCB-00216 (Izembek WWII Camp 3), XCB-00217 (Izembek WWII Camp 4), and XCB-00218 (Izembek WWII Utility Line), which were determined eligible for listing in the National Register of Historic Places (NRHP) in 2013 under Criterion D for their potential to yield important information; and

WHEREAS, USACE has determined that the undertaking will have an adverse effect on XCB-00218 because proposed excavation and fill would intrude into the mapped boundary of the site, and USACE has determined that avoidance or minimization alternatives sufficient to avoid that effect are not practicable for that historic property, and that XCB-00216 and XCB-00217 have the potential to be adversely affected; and

WHEREAS, the 2025 field effort identified three previously unrecorded historic-period sites associated with World War II activities: DWL-1-2025 (WWII Defensive Fencing/Rommel Stakes), DWL-2-2025 (WWII Pit Features and Trash Scatter), and DWL-3-2025 (Historic Dump, Foundations, and Blinn Lake Boat Ramp) and have not yet been formally evaluated for NRHP eligibility; and

WHEREAS, DWL-1-2025, DWL-2-2025, and DWL-3-2025 are located within the APE and would be affected by the undertaking, and if one or more of those sites are determined eligible for NRHP listing, the undertaking is likely to have an adverse effect on those historic properties;

WHEREAS, USACE has notified the Advisory Council on Historic Preservation (ACHP) of the adverse effect determination pursuant to 36 CFR 800.6(a)(1), and the ACHP has declined to participate in consultation;

WHEREAS, USACE has invited the DOT&PF to sign this Agreement as an Invited Signatory as the Project sponsor and DOT&PF, by implementing the stipulations of this Agreement will address its obligations under Alaska Statute (AS) 41.35 in collaboration with the Office of History and Archaeology (OHA); and

WHEREAS, USACE and DOT&PF have consulted with the Agdaagux Tribe of King Cove, Aleutian Pribilof Islands Association, Qagan Tayagungin Tribe of Sand Point Village, Qawalangin Tribe of Unalaska, Native Village of Akutan, Native Village of Nelson Lagoon, the Native Village of False Pass, and the USFWS regarding the identification of properties of religious and cultural significance to them, the effects of the undertaking on historic properties, and have invited them to participate in the development of this Agreement; and

WHEREAS, USACE has invited the DOT&PF as the applicant, King Cove Corporation as the landowner, and the Agdaagux Tribe of King Cove as the local tribe with interest in the project, to sign this Agreement as Invited Signatories and has invited other consulting parties to sign this Agreement as Concurring Parties;

NOW, THEREFORE, USACE, DOT&PF, King Cove Corporation, Agdaagux Tribe of King Cove, and SHPO (Signatories) agree that the undertaking shall be implemented in accordance with the following stipulations to consider the effects of the undertaking on historic properties and to satisfy USACE responsibilities under Section 106 of the NHPA.

Stipulations

USACE shall ensure that the following stipulations are implemented.

I. Roles and Responsibilities

A. DOT&PF, as the designated non-federal representative and Project sponsor, shall carry out the responsibilities assigned to DOT&PF in this Agreement in coordination with USACE.

B. USACE remains legally responsible for compliance with Section 106 and is responsible for government-to-government consultation in fulfillment of federal trust responsibilities with Tribes [36 CFR 800.16(m)].

C. Signatories and consulting parties will notify the USACE if a point of contact within their organization changes and provide updated information.

II. Standards

A. The USACE shall ensure that all work carried out pursuant to this Agreement meets the Secretary of the Interior (SOI) Standards for Archaeology and Historic Preservation (found at http://www.nps.gov/history/local-law/arch_stnds_9.htm).

B. The USACE shall ensure that all archaeological survey, evaluation, monitoring, testing, data recovery, documentation, human remains assessment, reporting, and other cultural resources work carried out under this Agreement shall be conducted by, or under the direct supervision of qualified professionals for the applicable discipline (48 FR 44738-44739).

C. National Register evaluations and determinations of eligibility shall be prepared in accordance with 36 CFR 800.4(c), 36 CFR Part 63, National Register Bulletin guidance, and the current Alaska Office of History and Archaeology standards for investigating and reporting archaeological and historic properties in Alaska.

D. The USACE recognizes that Tribes or other groups may have special expertise regarding places of traditional religious, spiritual, or cultural significance, but these individuals or groups may not meet the standards in II.A and II.B. However, the USACE will equally consider and incorporate special expertise into decisions regarding the implementation of this Agreement, consistent with 36 CFR 800.2(c)(2).

III. Administrative Stipulations

A. This Agreement shall apply to the Project and all of its Phases, Components, and Stages, including those not known as this time or not specified in the permit application or other Project documents, so long as the activities occur within the jurisdiction of a participating state or federal agency.

B. The Signatories recognize that certain information about historic properties or archaeological resources is protected from public disclosure under the NHPA (54 USC 307103), the Archaeological Resources Protection Act (ARPA; 43 CFR 7.18), and Alaska State law, as required by Public Law 96-95, AS 40.25.120(a)(4), and Policy and Procedure No. 50200. Parties to this Agreement shall ensure that all actions and documentation prescribed by this Agreement are consistent with the non-disclosure requirements of these laws. Documents containing sensitive information, including the location, character, or ownership of historic properties when disclosure may cause a significant invasion of privacy, risk harm to the historic property, or impede the use of a traditional religious site by practitioners, shall be marked confidential. Public deliverables shall be prepared in a manner that avoids disclosure of sensitive information.

C. Email will be an acceptable form of communication between the Signatories and consulting parties and is an appropriate method of “notification” or “in writing” where it is called for in this Agreement, unless otherwise described. If a consulting party does not have access to email or consistently available internet service, and communicates a preference for an alternative communication route too the USACE, then the USACE will ensure that the requested form of communication is made available.

D. In the event that another federal agency, not initially a party to this Agreement, receives an application for funding/license/permit for the Project, as it is described in this Agreement, that agency may fulfill its Section 106 responsibilities by stating in writing that it concurs with the terms of this Agreement and by notifying the Signatories that it intends to do so. Upon the written agreement of USACE and SHPO, the agency will execute a Signature Page and file it with the ACHP and USACE. The agency may then fulfill its Section 106 responsibilities through the implementation of the terms of this Agreement.

E. This Agreement may be executed in counterparts, each of which shall be deemed an original, but all of which together shall constitute one and the same instrument. The USACE may consolidate the original signature pages to produce the final copies. The USACE will distribute copies of all pages to all Consulting Parties once the Agreement is signed.

IV. Area of Potential Effects and Design Refinement

A. The APE for this undertaking is described in Appendix A, but the Project design at the time of Agreement execution is considered preliminary. As DOT&PF finalizes the Project design, they will attempt to integrate additional measures to avoid or minimize effects to historic properties, which may include minor alignment shifts, embankment narrowing, changes to side slopes, adjustments to drainage features, work-limit restrictions, fencing, and other practicable measures.

1. For purposes of construction planning, DOT&PF shall maintain a construction footprint map showing the fill footprint, cut/fill limits, right-of-way, temporary construction areas, known site boundaries, and protective buffers or environmentally sensitive areas.

B. If design refinements, material site changes, staging areas, access routes, disposal areas, construction methods, or other Project changes would extend the area of ground disturbance or potential effects beyond the APE or the Project changes would alter the character or nature of potential effects, DOT&PF shall notify USACE before such work proceeds.

1. USACE, in consultation with SHPO and other consulting parties as appropriate, shall determine whether the APE must be revised and whether additional identification, evaluation, or assessment of effects is required.

a) If USACE determines that the Project changes will alter the finding of effect or will necessitate changes to the level of effort for the identification of historic properties and/or any measures previously agreed upon to avoid, minimize, or mitigate adverse effects, then USACE shall initiate a 30-day review and comment period with Signatories and consulting parties.

(1) USACE shall distribute updated documentation to the Signatories and consulting parties, including a revised map of the APE, a detailed description of the Project changes, and as applicable, proposed changes to identification, minimization, or mitigation.

(2) USACE shall take any timely comments received into consideration and notify the Signatories and consulting parties of their decision. As needed, USACE shall initiate any amendments to the Agreement.

2. If USACE determines that IV.B.1.a does not apply, then the USACE will notify the Signatories and consulting parties of the Project changes within 30 days of their determination for informational purposes.

a) If the Signatories and/or consulting parties disagree with the USACE's determination, then USACE will consult with the objecting party and if needed, implement Stipulation XIII.

V. Completion of Identification and Assessment of Effects

A. USACE shall ensure that adequate phased identification of historic properties and assessment of effects have been completed commensurate to the defined phase or component before DOT&PF or their contractors initiate Project activities that could cause effects to historic properties as a result of the relevant phase or component.

1. USACE, in consultation with SHPO and other consulting parties, has determined that identification and evaluation efforts have not been completed in areas depicted as identification incomplete in Appendix A. Project activities may move forward in areas that have completed identification and, as needed, have completed on-site mitigation measures to resolve adverse effects.

2. To support phased identification, DOT&PF will submit to USACE a draft research design for areas with incomplete identification to assist USACE's decision-making on how to complete the identification of historic properties. The research design will address where intensive pedestrian survey is needed, what subsurface testing strategy will be used, how metal detecting will be incorporated, and what data will be gathered to support determinations of eligibility for DWL-1-2025, DWL-2-2025, DWL-3-2025, and any newly identified cultural resources.

3. USACE will provide Signatories a 30-day review period on the proposed level of effort. Within 15 days of the end of the comment period, USACE will provide DOT&PF direction on any needed revisions.

a) USACE, in consultation with SHPO and the other Signatories, may authorize DOT&PF to move forward with project activities in areas that need further identification efforts prior to completing consultation on the research design or implementing the research design, if there will be no ground disturbance or other activities that have potential to cause adverse effects.

4. DOT&PF shall implement the research design as needed to complete phased identification.

B. DOT&PF shall provide draft reports, determinations of eligibility, treatment plans, monitoring reports, and other deliverables to USACE for review. Unless otherwise specified in the Agreement, Signatories and consulting parties will have a 30-day review and comment period on all documentation deemed adequate by USACE.

C. Upon receipt of adequate documentation in support of determinations of NRHP eligibility and/or findings of effect, USACE will request SHPO concurrence and comments from Signatories and consulting parties consistent with 36 CFR 800.4 and 800.5. USACE may authorize DOT&PF to directly distribute this documentation, including USACE's determination and/or findings, to Signatories and consulting parties.

1. If a Signatory or consulting party does not agree with one or more NRHP eligibility determinations, then USACE will consult with the objecting party and if needed, seek a determination of eligibility from the Keeper of the NRHP consistent with 36 CFR 800.4(c)(2).

2. If a Signatory or consulting party does not agree with a finding of effect, then USACE will consult with the objecting party and if needed, seek comment from the ACHP.

3. Until formal determinations of eligibility are completed, unevaluated cultural resources shall be treated as eligible for NRHP listing for purposes of avoidance and protection. Site boundaries for unevaluated cultural resources will be estimated as no less than 50 feet from the greatest extent of known cultural material.

D. AHRS Updates

1. DOT&PF shall ensure that AHRS site forms and associated documentation are updated for XCB-00216, XCB-00217, XCB-00218, DWL-1-2025, DWL-2-2025, DWL-3-2025, and any additional cultural resources identified or evaluated under this Agreement no later than six months after the execution of this Agreement or six months after the discovery of any previously unidentified historic property.

VI. Avoidance and Minimization

A. DOT&PF shall seek to avoid and minimize effects to historic properties during final design, permitting, and construction. Avoidance and minimization measures shall be incorporated into plans, specifications, and estimates and into construction contract documents as enforceable requirements.

1. Known site boundaries, including a 50 ft buffer, shall be shown as environmentally sensitive or restricted areas on confidential plan sheets and on field materials provided to qualified cultural resources personnel. Non-confidential construction drawings may depict restricted work areas without disclosing sensitive site details.

2. No construction access, equipment staging, material storage, borrow, waste, or other ground-disturbing activity shall occur within protected site areas unless authorized under a treatment plan approved pursuant to this Agreement.

3. DOT&PF shall include stop-work provisions, inadvertent discovery procedures, monitoring requirements, and avoidance-area restrictions in construction contract documents.

VII. Resolution of Adverse Effects and Treatment Measures

A. Known Historic Properties

1. Historic Property Documentation: Qualified professionals shall augment existing site characterization for XCB-00218 through additional fieldwork (and, if applicable, XCB-00216 and XCB-00217) and document these efforts in a report. The report will define the site's boundary, include a detailed map, photographs of notable features and associated structures and objects, a detailed description of the site and its notable features, structures, and objects; and the site's relationship to the broader World War II landscape or other relevant theme. Additional fieldwork will include sub-surface testing (no less than one 50 cm2 test unit) and metal detector or other remote sensing techniques.

a) DOT&PF will submit a draft report to USACE no later than six months after completing the fieldwork, but in no event more than two years after execution of this programmatic agreement. USACE will distribute the draft to the Signatories and consulting parties for a 45-calendar-day review period.

b) USACE shall consider timely comments received and provide direction to DOT&PF regarding necessary revisions within 30 days. DOT&PF will provide a revised document to USACE for review within 90 days.

c) Upon USACE approval, they will distribute the final as a digital pdf to the Signatories and consulting parties.

2. World War II Historic Context and Synthesis: As mitigation for adverse effects to World War II-era historic properties, DOT&PF shall prepare a professional technical synthesis addressing the World War II military landscape in the Cold Bay, Blinn Lake, Kinzarof Lagoon, Outpost Road, and Izembek vicinity, with emphasis on the sites affected by the undertaking. The synthesis shall compile existing AHRS data, previous investigations, 2025 survey results, future identification efforts, archival sources, historical maps and aerial imagery, and treatment results generated under this Agreement.

a) USACE will require the DOT&PF to produce and distribute the draft synthesis to the Signatories and consulting parties for a 45-calendar-day review period no later than two years after all identification and evaluation efforts are complete, or in any case no more than four years after the execution of the Agreement.

b) USACE shall consider timely comments received and provide direction to DOT&PF regarding necessary revisions within 30 days. DOT&PF will provide a revised document to USACE for review within 90 days.

c) Upon USACE approval, they will distribute the final as a digital pdf to the Signatories and consulting parties.

B. Public Interpretation

1. DOT&PF shall develop a public-facing interpretive product based on non-confidential information generated through the treatment program. The interpretive product may take the form of a brochure, digital story map, public web page, exhibit panel, or other format agreed to by the signatories. The product shall avoid disclosure of sensitive archaeological site-location information.

a) Within two years after all identification and evaluation efforts are complete, or in any case no more than four years of execution of the Agreement, USACE will require the DOT&PF to produce and distribute a proposal to Signatories and consulting parties for a 30-day comment period regarding a public interpretation product that reflects input from Signatories and consulting parties gathered during the last annual reporting and meeting process.

b) Within six months of the end of the comment period, USACE will distribute a draft deliverable to Signatories and consulting parties for a 30-day comment period.

c) USACE shall consider timely comments received and provide direction to DOT&PF regarding necessary revisions within 30 days. DOT&PF will provide a revised document to USACE for review within 90 days.

d) Upon USACE approval, they will distribute the final to the Signatories and consulting parties.

C. Previously Unidentified Historic Properties

1. In the event that additional historic properties will be adversely affected by the undertaking, DOT&PF shall implement an approved Treatment Plan or property-specific treatment plan prior to any on-site Project activities that may adversely affect the respective historic property.

a) DOT&PF shall distribute a draft Treatment Plan to Signatories and consulting parties for review and comment no later than 90 days after USACE's adverse effect finding, except where inadvertent discovery procedures apply under Stipulations VIII or IX.

b) Signatories and consulting parties will have 30 days to review and comment on the draft treatment plan.

c) USACE shall consider timely comments received and provide direction to DOT&PF regarding necessary revisions within 30 days. DOT&PF will provide a revised document to USACE for review within 90 days.

d) Upon USACE approval, they will distribute the final as a digital pdf to the Signatories and consulting parties.

2. A Treatment Plan shall identify the affected historic property or properties, the basis for eligibility, the portions of each property that would be affected, the research questions or documentation objectives, field and laboratory methods, curation arrangements, reporting requirements, and consultation procedures.

VIII. Archaeological Construction Monitoring

A. DOT&PF shall provide archaeological construction monitoring in accordance with Appendix B. Monitoring shall occur during ground-disturbing activities within or adjacent to known historic properties, unevaluated cultural resources treated as eligible, areas of high sensitivity, and other areas identified by USACE in consultation with SHPO and consulting parties.

1. DOT&PF shall retain a Supervisory Archaeological Monitor (SAM) meeting the Secretary of the Interior Professional Qualification Standards for archaeology. More than one monitor may be required where ground disturbance occurs concurrently in multiple locations.

2. Before each construction season or major construction phase, DOT&PF shall conduct a preconstruction meeting and cultural resources awareness training for construction personnel, the Project Engineer, resident engineer, contractors, subcontractors, the SAM, archaeological monitors, and invited observers.

3. The SAM and archaeological monitors shall have authority to temporarily stop work in the immediate area of a discovery, potential discovery, or unanticipated effect consistent with Stipulation X.

4. Monitoring results shall be documented in weekly monitoring memoranda, annual monitoring reports, and a final monitoring report as described in Appendix B.

IX. Treatment of Human Remains, Funerary Objects, Sacred Objects, and Objects of Cultural Patrimony

A. Any human remains, including cremated human remains, shall be treated at all times with dignity and respect. If human remains are encountered or funerary objects, sacred objects, or objects of cultural patrimony are identified, then construction shall immediately stop within 200 feet of the discovery, the area shall be protected, and notifications shall be made in accordance with Appendix E.

1. DOT&PF shall immediately notify USACE, the Alaska State Troopers, the Alaska State Medical Examiner, SHPO, the landowner or land-managing agency, and consulting Tribes and Native organizations identified in Appendix D.

2. No remains shall be moved or further disturbed except as required by law enforcement, the State Medical Examiner, or the treatment procedures developed through consultation.

3. If the remains are determined not to be forensic, USACE and DOT&PF shall consult with SHPO, appropriate Tribes and Native organizations, the landowner or land-managing agency, and other parties as required by applicable law to determine treatment, custody, analysis, and final disposition. USACE and DOT&PF shall implement the notification and consultation procedures in Appendix D.

X. Inadvertent Discoveries and Unanticipated Effects

A. If previously unidentified cultural resources are discovered, or if a known historic property is affected in an unanticipated manner, DOT&PF shall implement the Cultural Resources Discovery Plan in Appendix C. Construction may continue outside the protected discovery area if the work will not affect the discovery or impede consultation.

1. The discovery area shall be secured with a protective buffer appropriate to the resource type and site conditions. Unless otherwise approved by USACE in consultation with the SHPO and appropriate parties, a minimum 100-foot buffer shall be established for cultural resources and a minimum 200-foot buffer shall be established for human remains or potential human remains.

2. Unevaluated discoveries shall be treated as eligible for the NRHP until USACE, in consultation with SHPO and other consulting parties as appropriate, completes an eligibility determination or decides to treat the resource as eligible for purposes of the undertaking.

3. If the discovery is eligible and will be adversely affected, USACE shall develop a treatment plan, or if a treatment plan already exists for the historic property, a treatment addendum in consultation with Signatories and consulting parties before work resumes in the discovery area.
In the event of an inadvertent discovery or unanticipated effect, Signatories and consulting parties will have seven (7) days to review a draft treatment plan or treatment addendum. On-site treatment measures may begin after USACE approval of the treatment plan or addendum. Work may not resume in the discovery area until all on-site treatment measures have been completed.

XI. Curation and Records Management

A. Artifacts, samples, field notes, digital data, photographs, maps, reports, and other records generated under this Agreement shall be curated or managed in accordance with applicable federal and state requirements, permit conditions, landowner requirements, and the curation provisions of the approved Treatment Plan.

1. Before fieldwork begins, DOT&PF shall identify the intended repository or repositories for collections and records, and shall obtain any required repository agreements or permits.

2. Collections from federal lands shall be curated in accordance with 36 CFR Part 79 and applicable agency requirements. Collections from State, municipal, private, Native corporation, or other lands shall be curated or managed consistent with applicable law, landowner requirements, and any agreements reached through consultation. All collections and associated records will be curated or returned to their owner(s) within 5 years of the Agreement's execution.

a) In the event that collections and associated records will not be deposited in a repository meeting 36 CFR Part 79, DOT&PF will provide the State of Alaska's Office of History and Archaeology a copy of all field records generated by the project and a complete artifact and sample catalog in support of AS 41.35.070.

3. DOT&PF and its contractors shall maintain collections and records in a secure, stable, and organized condition from recovery through final deposition.

XII. Reporting, Consultation, and PA Review

A. DOT&PF shall submit an annual report to USACE, other Signatories, and consulting parties on or before June 30 of each year while this Agreement is in effect to document compliance with the Agreement.

1. The annual report shall summarize Project design and construction status, identification and evaluation completed, treatment measures completed or planned, monitoring results, discoveries, curation status, deliverables, consultation activities, schedule updates, and any recommended amendments. The annual report shall list any reports generated as a result of the Agreement.

2. USACE shall distribute the annual report to Signatories and consulting parties and provide a 45-calendar-day review period.

3. USACE will distribute a final or revised annual report to Signatories and consulting parties no later than 30 days after the end of the review period.

B. DOT&PF shall coordinate an annual Project update meeting with the other Signatories and consulting parties no earlier than 30 days after the end of the annual report comment period. The meeting may be held virtually.

C. DOT&PF may submit interim reports, determinations of eligibility, findings of effect, treatment plan addenda, monitoring summaries, and other correspondence as needed to accommodate the Project schedule. Signatories and consulting parties will have 30 days to review and comment, unless otherwise specified in the Agreement.

XIII. Dispute Resolution

A. Should any Signatory or consulting party object to any action proposed under this Agreement or to the manner in which the terms of this Agreement are implemented, USACE shall consult with the objecting party to resolve the objection. DOT&PF shall assist USACE by providing relevant documentation and proposed resolutions.

B. If USACE determines that the objection cannot be resolved, USACE shall:

1. Forward all documentation relevant to the dispute, including the USACE's proposed resolution, to the ACHP. The ACHP shall provide USACE with its advice on the resolution of the objection within thirty (30) days of receiving adequate documentation. Prior to reaching a final decision on the dispute, USACE shall prepare a written response that takes into account any timely advice or comments regarding the dispute from the ACHP, Signatories, and consulting parties, and provide them with a copy of this written response. USACE will then proceed according to its final decision.

2. If the ACHP does not provide its advice regarding the dispute within the thirty (30) day time period, USACE may make a final decision on the dispute and proceed accordingly. Prior to reaching such a final decision, USACE shall prepare a written response that takes into account any timely comments regarding the dispute from the Signatories and consulting parties to the Agreement, and provide them and the ACHP with a copy of such written response.

C. USACE's responsibility to carry out all other actions subject to the terms of this Agreement that are not the subject of the dispute remain unchanged.

XIV. Amendments

A. Any Signatory may request that this Agreement be amended. USACE shall consult with the Signatories to consider the requested amendment. Amendments to the body of this Agreement shall be effective only when signed by all Signatories.

B. Appendices may be amended by written concurrence of the Signatories, unless USACE determines that amendment to the body of the Agreement is required.

C. Signatories and consulting parties may request a timeline extension regarding product delivery and review – to exclude Stipulation XV. *Duration* - from USACE. USACE, in consultation with Signatories, will consider time extension requests, and if granted, a timeline extension will not require an amendment to the Agreement with written agreement of the Signatories.

XV. Duration

A. This Agreement shall remain in effect for five years from the date of execution unless it is terminated or amended. At least six months before expiration, DOT&PF shall notify USACE whether the stipulations have been completed. If any stipulations remain incomplete, USACE shall consult with the Signatories regarding extension, amendment, or termination.

XVI. Termination

A. If any Signatory determines that the terms of this Agreement cannot be carried out, that party shall immediately consult with the other Signatories to seek amendment. If the Signatories cannot agree to an amendment within 30 calendar days, or another period agreed to by the Signatories, any Signatory may terminate this Agreement by written notice to the other Signatories. If this Agreement is terminated, USACE shall comply with 36 CFR 800.6 or 36 CFR 800.7 before authorizing further work that may affect historic properties. USACE shall notify the Signatories as to the course of action it will pursue.

XVII. Anti-Deficiency Act

A. The obligations of federal agencies under this Agreement are subject to the availability of appropriated funds and the provisions of the Anti-Deficiency Act, 31 USC 1341. DOT&PF obligations are subject to the availability of appropriated funds and applicable state fiscal requirements. The parties shall make reasonable and good-faith efforts to secure the funds necessary to implement this Agreement.

Execution and implementation of this Agreement evidence that USACE has taken into account the effects of the undertaking on historic properties and has afforded the ACHP an opportunity to comment in accordance with Section 106 of the NHPA.

Programmatic Agreement Among
The U.S. Army Corps of Engineers, Alaska District;
and The Alaska State Historic Preservation Officer;
Regarding the King Cove to Cold Bay Road Project
POA-2010-00286, Kinzarof Lagoon, Alaska

Signature Pages

Programmatic Agreement Among
The U.S. Army Corps of Engineers, Alaska District; and
The Alaska State Historic Preservation Officer;
Regarding the King Cove to Cold Bay Road Project
POA-2010-00286, Kinzarof Lagoon, Alaska

U.S. Army Corps of Engineers, Alaska District

8 July 2026

Heather N. Markway, South Branch Chief, Alaska District, U.S. Corps of Engineers

Date

Programmatic Agreement Among
The U.S. Army Corps of Engineers, Alaska District; and
The Alaska State Historic Preservation Officer;
Regarding the King Cove to Cold Bay Road Project
POA-2010-00286, Kinzarof Lagoon, Alaska

Alaska State Historic Preservation Officer

Sarah Meitl

Sarah Meitl, Deputy State Historic Preservation Officer

7/7/2026

Date

Programmatic Agreement Among
The U.S. Army Corps of Engineers, Alaska District; and
The Alaska State Historic Preservation Officer;
Regarding the King Cove to Cold Bay Road Project
POA-2010-00286, Kinzarof Lagoon, Alaska

Alaska Department of Transportation and Public Facilities

7/7/2026

[Name, Title] Date

Programmatic Agreement Among
The U.S. Army Corps of Engineers, Alaska District; and
The Alaska State Historic Preservation Officer;
Regarding the King Cove to Cold Bay Road Project
POA-2010-00286, Kinzarof Lagoon, Alaska

Agdaagux Tribe of King Cove

Etta Kuzakin, President 7/8/24
[Name, Title] Date

Programmatic Agreement Among
The U.S. Army Corps of Engineers, Alaska District; and
The Alaska State Historic Preservation Officer;
Regarding the King Cove to Cold Bay Road Project
POA-2010-00286, Kinzarof Lagoon, Alaska

King Cove Corporation

Chantae Kochuten, CEO 07/07/2026
[Name, Title] Date

Appendix A
Area of Potential Effect

The area of potential effect (APE) for this project includes the project area as identified on the figures submitted with the Individual Permit application filed under POA-2010-00286, Kinzarof Lagoon. The project APE was established to include direct construction areas, the ROW obtained for the project, and a buffer (between 100 to 200 feet outside of ROW) to include those areas that have the potential for effects from visual, aesthetic, vibratory, and proximity (i.e. noise, dust) impacts. The APE is depicted on the attached figures.

APE
ROW
FILL FOOTPRINT
IZEMBEK NATIONAL WILDLIFE REFUGE

0 0.75 1.5 MILES

LOCATION AND VICINITY

KING COVE TO COLD BAY ROAD DESIGN

DATE: MARCH 2026

MAP 1

J:\50\63353-01\60GIS\Carto\CUL\63353 CUL.aprx Mar 11, 2026 2:43 PM

Service Layer Credits: ahri_2020_rgb_cache (ahri_2020_rgb_cache):

APE
ROW
FILL FOOTPRINT

* CULTURAL DATA ARE CONFIDENTIAL AND NOT FOR PUBLIC DISTRIBUTION.

FEET
0 1,000 2,000

CULTURAL RESOURCE DETAIL

KING COVE TO COLD BAY ROAD DESIGN

DATE: JULY 2026

MAP 2.1

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Service Layer Credits: ahri_2020_rgb_cache (ahri_2020_rgb_cache):

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ROW
FILL FOOTPRINT

* CULTURAL DATA ARE CONFIDENTIAL AND NOT FOR PUBLIC DISTRIBUTION.

FEET
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CULTURAL RESOURCE DETAIL

KING COVE TO COLD BAY ROAD DESIGN

DATE: JULY 2026

MAP 2.2

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Service Layer Credits: ahri_2020_rgb_cache (ahri_2020_rgb_cache):

FIELD VERIFIED SITE*

SITE BOUNDARY

APE

ROW

FILL FOOTPRINT

PORTION OF CULTURAL SITE WITHIN FILL FOOTPRINT

** CULTURAL DATA ARE CONFIDENTIAL AND NOT FOR PUBLIC DISTRIBUTION.*

FEET
0 1,000 2,000

CULTURAL RESOURCE DETAIL

KING COVE TO COLD BAY ROAD DESIGN

DATE: JULY 2026

MAP 2.3

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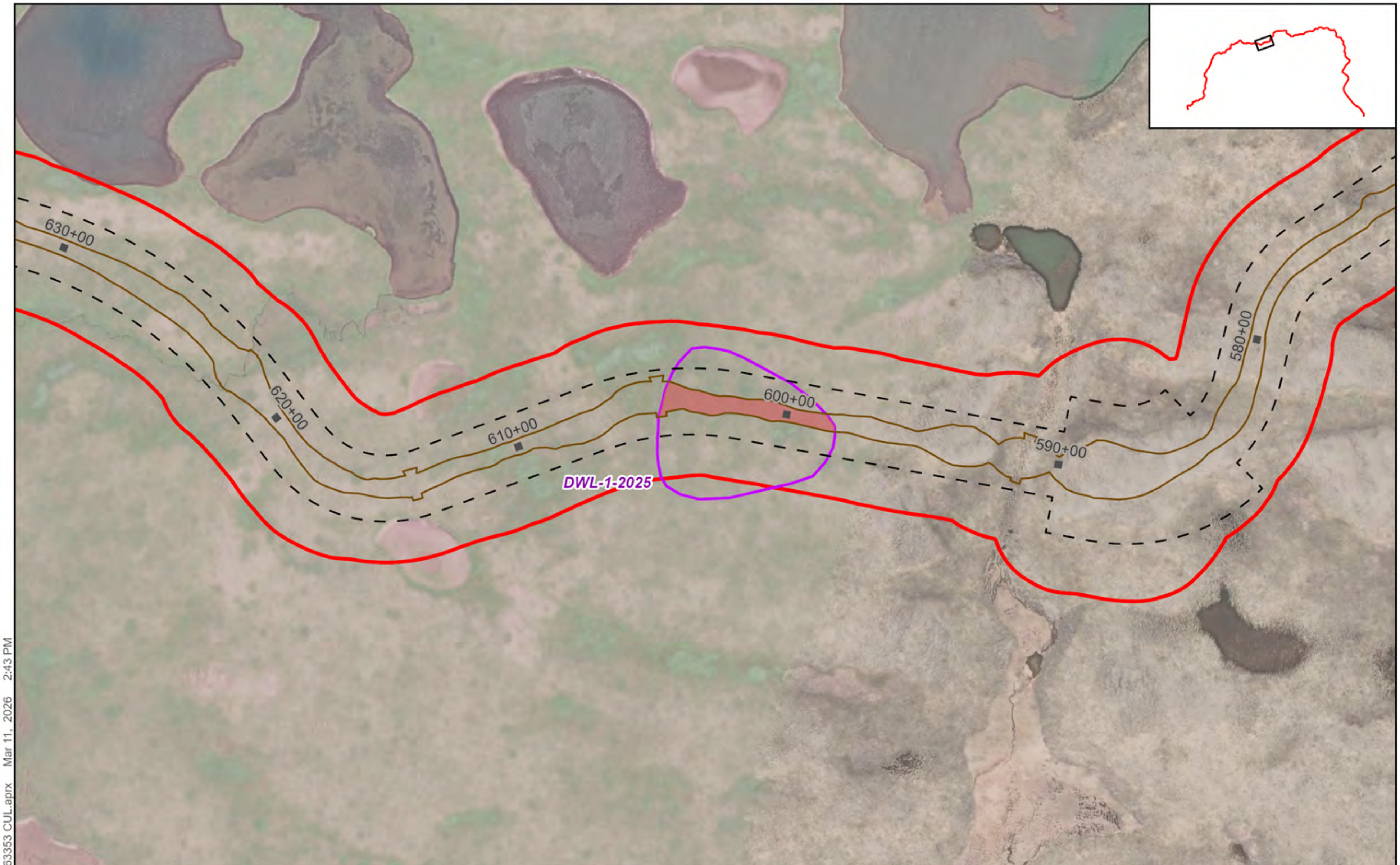
Service Layer Credits: ahri_2020_rgb_cache (ahri_2020_rgb_cache):



FIELD VERIFIED SITE*

SITE BOUNDARY

APE

ROW

FILL FOOTPRINT

PORTION OF CULTURAL SITE WITHIN FILL FOOTPRINT

* CULTURAL DATA ARE CONFIDENTIAL AND NOT FOR PUBLIC DISTRIBUTION.

FEET
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CULTURAL RESOURCE DETAIL

KING COVE TO COLD BAY ROAD DESIGN

DATE: MARCH 2026

MAP 2.1

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Service Layer Credits: ahri_2020_rgb_cache (ahri_2020_rgb_cache):

FIELD VERIFIED SITE*

- SITE BOUNDARY
- LINEAR FEATURE
- LOCATION OF POLE ASSOCIATED WITH XCB-0218

- APE
- ROW
- FILL FOOTPRINT
- PORTION OF CULTURAL SITE WITHIN FILL FOOTPRINT
- POLE WITHIN THE FILL FOOTPRINT

** CULTURAL DATA ARE CONFIDENTIAL AND NOT FOR PUBLIC DISTRIBUTION.*

0 1,000 2,000 FEET

CULTURAL RESOURCE DETAIL

KING COVE TO COLD BAY ROAD DESIGN

DATE: JULY 2026

MAP 2.4

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Service Layer Credits: ahri_2020_rgb_cache (ahri_2020_rgb_cache):

FIELD VERIFIED SITE*

SITE BOUNDARY

LINEAR FEATURE

LOCATION OF POLE ASSOCIATED WITH XCB-0218

APE

ROW

FILL FOOTPRINT

** CULTURAL DATA ARE CONFIDENTIAL AND NOT FOR PUBLIC DISTRIBUTION.*

FEET
0 250 500

CULTURAL RESOURCE DETAIL

KING COVE TO COLD BAY ROAD DESIGN

DATE: MARCH 2026

MAP 2.2

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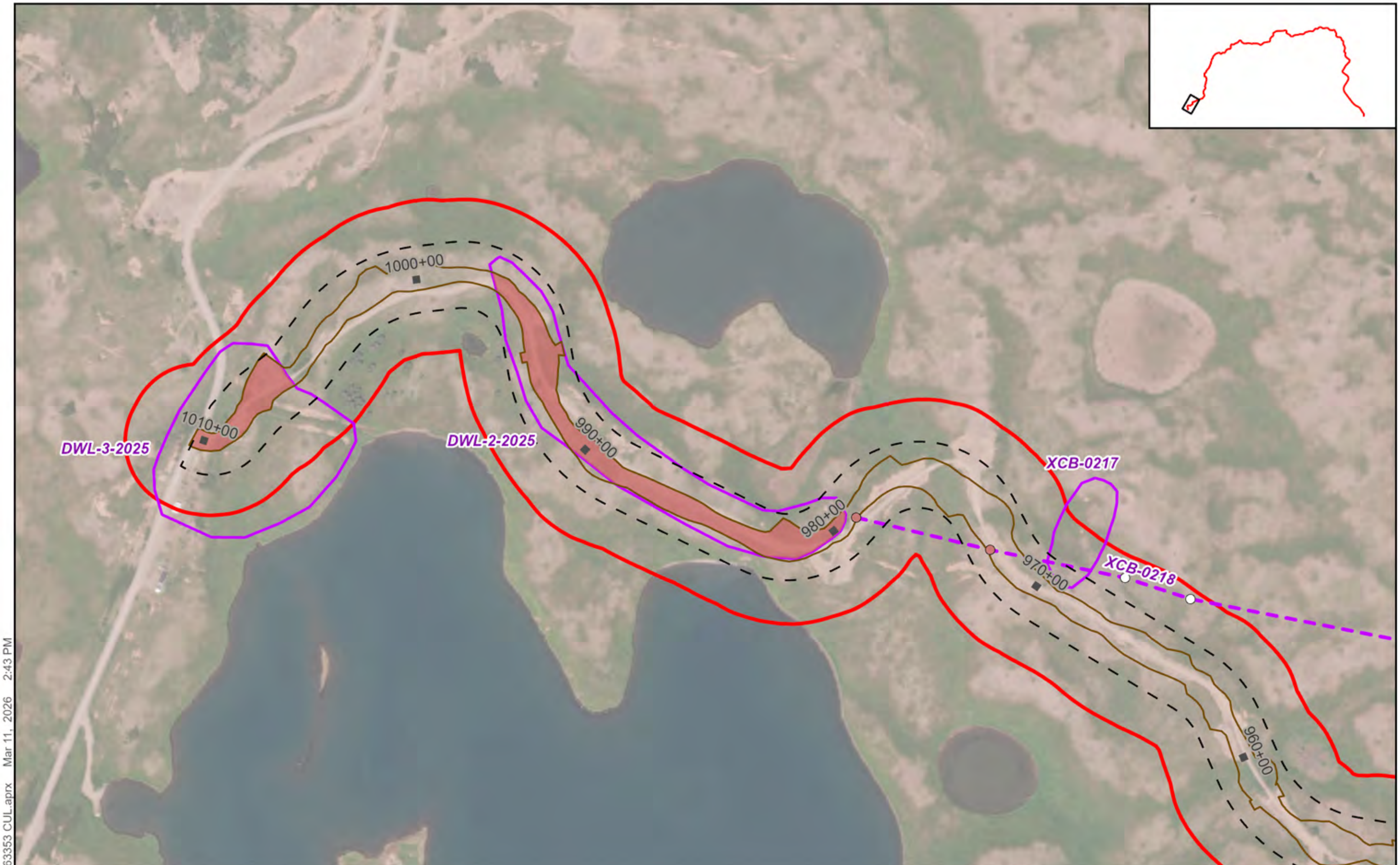
Service Layer Credits: ahri_2020_rgb_cache (ahri_2020_rgb_cache):



FIELD VERIFIED SITE*

- SITE BOUNDARY
- LINEAR FEATURE
- LOCATION OF POLE ASSOCIATED WITH XCB-0218
- APE
- ROW
- FILL FOOTPRINT
- PORTION OF CULTURAL SITE WITHIN FILL FOOTPRINT
- POLE WITHIN THE FILL FOOTPRINT

** CULTURAL DATA ARE CONFIDENTIAL AND NOT FOR PUBLIC DISTRIBUTION.*

0 250 500 FEET

CULTURAL RESOURCE DETAIL

KING COVE TO COLD BAY ROAD DESIGN

DATE: MARCH 2026

MAP 2.3

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Service Layer Credits: ahri_2020_rgb_cache (ahri_2020_rgb_cache):

APE

ROW

FILL FOOTPRINT

PEDESTRIAN SURVEY COVERAGE (10 M)

SURVEY COVERAGE

KING COVE TO COLD BAY ROAD DESIGN

DATE: JULY 2026

MAP 3.1

Service Layer Credits: ahri_2020_rgb_cache (ahri_2020_rgb_cache):

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APE

ROW

FILL FOOTPRINT

PEDESTRIAN SURVEY COVERAGE (10 M)

FEET
0 1,000 2,000

SURVEY COVERAGE

KING COVE TO COLD BAY ROAD DESIGN

DATE: JULY 2026

MAP 3.2

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Service Layer Credits: ahri_2020_rgb_cache (ahri_2020_rgb_cache):

FIELD VERIFIED SITE*

SITE BOUNDARY

APE

ROW

FILL FOOTPRINT

PEDESTRIAN SURVEY COVERAGE (10 M)

* CULTURAL DATA ARE CONFIDENTIAL AND NOT FOR PUBLIC DISTRIBUTION.

FEET

0 1,000 2,000

SURVEY COVERAGE

KING COVE TO COLD BAY ROAD DESIGN

DATE: JULY 2026

MAP 3.3

J:\50\63353-01\60GIS\Carto\CUL\63353 CUL.aprx Jul 03, 2026 11:47 AM

Service Layer Credits: ahri_2020_rgb_cache (ahri_2020_rgb_cache):

FIELD VERIFIED SITE*
LINEAR FEATURE
SITE BOUNDARY

APE
ROW
FILL FOOTPRINT
PEDESTRIAN SURVEY COVERAGE (10 M)

** CULTURAL DATA ARE CONFIDENTIAL AND NOT FOR PUBLIC DISTRIBUTION.*

0 1,000 2,000 FEET

SURVEY COVERAGE

KING COVE TO COLD BAY ROAD DESIGN

DATE: JULY 2026

MAP 3.4

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Service Layer Credits: ahri_2020_rgb_cache (ahri_2020_rgb_cache):

Appendix B
Archaeological Monitoring Plan

I. Purpose and Scope

This Archaeological Monitoring Plan (Monitoring Plan) provides specific procedures and protocols for archaeological monitoring during construction of the King Cove to Cold Bay Road project (Project). The Alaska Department of Transportation and Public Facilities (DOT&PF) is committed to archaeological construction monitoring to protect previously unidentified historic properties and human remains.

Archaeological construction monitoring involves the close inspection of earth-moving and ground-disturbing activities. Archaeological monitoring also includes observation of areas prior to and after use by the Project. The DOT&PF Professionally Qualified Individual (PQI)[1] shall coordinate with the Project Engineer to ensure that a Supervisory Archaeological Monitor (SAM) is provided and/or contracted prior to the beginning of construction. More than one (1) archaeological monitor may be required, depending on whether ground-disturbing activity occurs simultaneously. More than one (1) SAM may be required for the Project if multiple phases are in construction. DOT&PF is responsible for oversight of archaeological monitoring and reporting, including coordination among archaeological monitors, as needed. **Archaeological monitoring will occur during all ground-disturbing activities within or adjacent to known cultural/historic properties and any properties subsequently discovered during progression of the project.**

The SAM will determine the number and placement of additional archaeological monitors in consultation with the DOT&PF PQI and Project Engineer. Archaeological monitoring will continue until the SAM and archaeological monitor(s), if present, has determined that excavation has reached the maximum depth at which cultural deposits can be expected.

II. Definitions

Archaeological monitor: Qualified individual who monitors ground-disturbing activities in order to identify, recover, protect, and/or document archaeological information or materials that are unearthed during these activities. Archaeological monitors have “stop work” authority if a previously unidentified cultural resource is discovered during archaeological monitoring. The archaeological monitor reports to the SAM.

The duties of the archaeological monitor include examining construction activity areas for evidence of cultural resources on a construction site, examining areas prior to Project activities, flagging areas for avoidance, and stopping Project activities in the event of an inadvertent discovery.

[1] The PQI is a Secretary of Interior (SOI)-qualified DOT&PF Cultural Resources Specialist.

Cultural resources: Cultural resources are defined as physical evidence of past human activity equal to or greater than fifty (50) years of age, including archaeological sites, sacred objects, features, artifacts, landscapes, and structures; buildings; plant and animal remains; sacred sites; items of cultural patrimony; and human remains. Specific examples of cultural resources that may be found in the Project area include round or rectangular structural pit features, basketry, projectile points, stone tools, hearths, grinding rock features, concentrations of human modified bone, horn and antler, beads, cache pits, fire-cracked rock, pottery, shell ornaments, cultural landscape features, culturally modified trees, building foundations, mining features, farming and homesteading features, glass bottles, ceramics, metal artifacts, and tin cans. Although "cultural resources" is not a term used in Section 106, the term is used in the Agreement and its appendices to describe (as the Agreement outlines) stipulations that deal with cultural resources that have not yet been evaluated or found to be eligible for the National Register of Historic Places (National Register).

Direct supervision/supervisor: A direct supervisor of an archaeological monitor is physically present on the jobsite or able to be physically present within thirty minutes in the event of an inadvertent discovery.

Earth moving/Ground disturbing: Anything that disturbs the soil and ground surface including hand scraping/scooping, trowels, shovels, heavy machinery (such as driving over previously undisturbed ground), grubbing, scraping of topsoil, and collection and dumping of materials such as gravel, soil, and organic material.

Historic properties: Historic properties are cultural resources that have been evaluated as included in or eligible for listing on the National Register (36 Code of Federal Regulations [CFR] 800.16(l)(1)).

Human remains: The remains of a deceased person, in whole or in parts, regardless of its stage of decomposition and post-mortem treatment. Cremated human remains are generally ash but can include bone and teeth fragments.

NAGPRA: Native American Graves Protection and Repatriation Act (NAGPRA; 25 United States Code 3001); Federal statute pertaining to the treatment of indigenous human remains, associated or unassociated funerary objects, sacred objects, or objects of cultural patrimony as defined by the act on federal lands and by repositories or museums.

"Stop work" authority: The duty given to specific individuals during Project construction to temporarily cease work operations in the vicinity of an inadvertent discovery.

Supervisory Archaeological Monitor: The SAM is an SOI-qualified archaeologist who is present for the duration of activities that require archaeological monitoring. The SAM also supervises archaeological monitors on-site. The SAM has stop work authority. The SAM must have a master's degree in archaeology or closely related field. The SAM will explain the roles of the monitors and the procedures to follow in the event that inadvertent discoveries, inadvertently affected historic properties, or discovery of human remains are made.

III. Professional Qualifications and Standards

Work under the terms of this Monitoring Plan shall be carried out by a SAM meeting the SOI's

Professional Qualifications Standards for Archaeologists (36 CFR 61). Archaeological monitors do not have to meet this requirement if they are under the direct supervision of the SAM or other SOI qualified archaeologist.

All documentation, evaluation, treatment, and reporting of cultural resources will meet current professional standards, including but not limited to the SOI *Standards and Guidelines for Archaeology and Historic Preservation* (48 *Federal Register* 44716).

IV. Archaeological Construction Monitoring

A. Prior to Construction Activities

1. Areas Requiring Archaeological Construction Monitoring

DOT&PF shall provide archaeological construction monitoring during ground-disturbing activities in areas where known historic properties or unevaluated cultural resources may be affected by construction.

Monitoring shall be required, at a minimum, within or adjacent to XCB-00218, XCB-00216, XCB-00217, DWL-1-2025, DWL-2-2025, DWL-3-2025, and any newly identified cultural resource that has not yet been evaluated for NRHP eligibility.

Unevaluated cultural resources within or adjacent to the construction footprint shall be treated as eligible for listing in the NRHP until USACE, in consultation with SHPO and other consulting parties, completes a determination of eligibility or elects to treat the resource as eligible for purposes of the undertaking.

Unless otherwise approved by USACE in consultation with DOT&PF, SHPO, and the Supervisory Archaeological Monitor, monitoring shall occur within the boundary of each identified or unevaluated cultural resource and within a default 164-foot, or 50-meter, buffer around that boundary.

DOT&PF shall identify monitoring areas on confidential construction-management maps and shall incorporate monitoring requirements, restricted work areas, stop-work procedures, and inadvertent discovery procedures into construction plans, contract documents, and preconstruction training materials. No ground-disturbing activity shall occur in an area requiring monitoring unless the SAM or archaeological monitor is present.

2. Acquire Permits for Archaeological Monitoring

Prior to any monitoring activities, DOT&PF or its qualified consultant shall acquire any and all permits necessary for conducting monitoring activities. DOT&PF and its contractors shall coordinate with all land-managing agencies.

Depending on the location of monitoring activities, permits may include a State Cultural Resources Investigation Permit from the Alaska Department of Natural Resources Office of History and Archaeology; Archaeological Resources Protection Act and/or Special Use Permits from the United States Fish and Wildlife Service. It is the responsibility of the permit holder to comply with any requirements or stipulations set forth in any permit received for monitoring

3. Preconstruction Meeting and Cultural Resources Awareness Training

No less than once per year, prior to the initiation of construction activities on the Project, the DOT&PF Project Engineer, DOT&PF PQI, SAM, and archaeological monitor(s) shall participate in a preconstruction meeting with the Construction Contractor, any on-site construction supervisory staff, the resident engineer, and subcontractors. DOT&PF will explain the roles of the SAM, and archaeological monitor(s) and the procedures to follow in the event inadvertent discoveries, discovery of inadvertently affected historic properties, or discovery of human remains are made. Preconstruction meetings may be required for each phase of the Project.

DOT&PF will invite the PA Signatories to attend the preconstruction meeting and will provide written notice by email to the PA Signatories at least fifteen (15) calendar days prior to the meeting. DOT&PF will notify the Construction Supervisor and other on-site authorities, in writing, of the archaeological presence and authority of the SAM and archaeological monitor(s) to stop construction work in the event of an inadvertent discovery or inadvertent effect to a historic property, or discovery of human remains. The Construction Supervisor shall inform all construction personnel of the roles of all monitors.

The SAM will lead cultural resources awareness training with construction personnel to educate them about the terms of the PA.

Preconstruction Training, as detailed in PA Stipulation IV.C, *Archaeological Construction Monitoring*, will be mandatory for contractors and subcontractors to ensure that construction personnel understand the terms of the PA and the types of resources that could be discovered or affected during Project construction.

B. Archaeological Monitoring Responsibilities

Each monitor shall maintain a daily log documenting location and type of construction and ground-disturbing activities, communications with construction personnel, descriptions and provenience of any inadvertent discoveries or artifacts collected or historic properties inadvertently affected, and other pertinent information.

During all earth-moving and ground-disturbing activities in areas identified on the project maps, at least one (1) SOI-qualified archaeological monitor shall be on the Project site to provide direct supervision. Following completion of the ground-disturbing activities, an archaeological monitor shall conduct a final site check for any inadvertently discovered or affected historic properties and human remains.

The SAM may recommend that monitoring occur in areas outside of the previously identified areas on project maps, but within the Direct APE, as necessary.

All monitors have the authority to “stop work” if they believe cultural resources are at risk of being adversely affected by construction activities. Archaeological monitors will immediately notify the SAM of an order to stop work. If no monitors are on-site, then any on-site construction staff shall be authorized to stop construction in the event of an inadvertent discovery until a SAM or other SOI-qualified professional is on-site. The SAM shall take appropriate action to protect cultural resources pending efforts to identify, evaluate, assess, and treat the cultural resource in consultation with the PA Signatories. Project activities may

No earth-moving or ground-disturbing activities will occur within one hundred sixty-four (164) feet (fifty [50] meters) of a known historic property without the presence of an archaeological monitor. Table 1 summarizes protection measures for both documented historic properties and inadvertent discoveries. The SAM may request agreement from the USACE to modify monitoring areas based on field observations. USACE, in consultation with Signatories, will have at least five business days to review SAM proposals.

Monitors will have maps and global positioning system (GPS) units with sub-meter accuracy, loaded with historic property boundaries consistent with Agreement stipulation VI.A.1.

C. Physical Protection Measures

The SAM will flag or guide the placement of construction fencing around historic properties and inadvertent discovery locations to define "avoidance areas" for construction personnel.

1. The SAM will make sure the flagging or fencing is appropriately placed to provide adequate protection to the resource from Project activities and to define avoidance areas. No Project activities may occur inside the flagged areas.

    a. Known historic properties

        i. The SAM shall place a buffer of no smaller than one hundred sixty-four (164) feet (fifty [50] meters), unless otherwise prevented by ground conditions.

        ii. If the property is subject to avoidance as a treatment measure, then no Project activities may occur inside the flagged areas. Otherwise an archaeological monitor must be present.

    b. Inadvertent discoveries of cultural resources or inadvertent adverse effects

        i. The SAM shall place a buffer of no smaller than 100 feet (61 meters) in diameter, unless otherwise prevented by ground conditions, will be established around the discovery.

        ii. No Project activities may occur inside the flagged areas.

    c. Human remains or other materials subject to NAGPRA

        i. The SAM shall place a buffer of no smaller than two hundred (200) feet (sixty-one [61] meters) in diameter around the discovery, unless otherwise prevented by ground conditions.

        ii. No Project activities may occur inside the flagged areas.

2. Flagging or construction fencing shall be removed only by or under the guidance of the SAM, after:
    a. All construction activities are complete in the area; or
    b. Site evaluation, assessment, and appropriate treatments are complete; or
    c. The USACE agrees, after consultation with the PA Signatories, that there is no further

need for the avoidance area and/or restricted activities.

construction personnel and subcontractors may conduct no further work in the avoidance areas until USACE, in consultation with the SAM and PA Signatories provides authorization to resume Project activities.

DOT&PF shall not permit vehicles, equipment, or unauthorized personnel to traverse any discovery site. Construction activities may continue elsewhere in the Project area.

Table 1. Protection Measures for Historic Properties and Inadvertent Discoveries

Reference	Buffer	Avoidance/Protection Measure
Monitoring Areas	164 feet (50 meters)	The SAM will flag or guide the placement of construction fencing around historic properties to define "avoidance areas" for construction personnel.
Inadvertent Discovery of Cultural Resource(s)	200 feet (61 meters)	Monitors will flag or guide the placement of construction fencing around historic properties to define "avoidance areas" for construction personnel. No construction activities may occur inside the flagged areas. Flagging or construction fencing shall be removed only by or under the guidance of the SAM, after: All construction activities are complete in the area; or Site evaluation, assessment, and appropriate treatments are complete; or The USACE agrees, after consultation with the PA Signatories, that there is no further need for a buffer
Inadvertent Discovery of NAGPRA Resources	200 feet (61 meters)	The SAM shall flag or guide the placement of construction fencing around historic properties to define "avoidance areas" for construction personnel. No construction activities may occur inside the flagged areas. Flagging or construction fencing shall be removed only by or under the guidance of the SAM after: All construction activities are complete in the area; or Site evaluation, assessment, and appropriate treatments are complete; or The USACE agrees, after consultation with the PA Signatories, that there is no further need for a buffer
Inadvertent Discovery of Human Remains	200 feet (61 meters)	The SAM will flag or guide the placement of construction fencing around historic properties to define "avoidance areas" for construction personnel. No construction activities may occur inside the flagged areas. Flagging or construction fencing shall be removed only by or under the guidance of the SAM, after: All construction activities are complete in the area; or Site evaluation, assessment, and appropriate treatments are complete; or The USACE agrees, after consultation with the PA Signatories, that there is no further need for a buffer

D. Reporting Requirements

1. Weekly Monitoring Memos

The SAM shall provide a summary construction monitoring memorandum on a weekly basis to the DOT&PF Project Engineer and DOT&PF PQI within one (1) business day of the end of the reporting period. The memorandum will summarize monitoring activities, including items such as times and locations of monitoring, inadvertently discovered or affected historic properties or burials, and other observations related to the monitoring. The DOT&PF PQI shall submit an electronic copy of the memorandum to the PA Signatories within two (2) business days of its receipt for their ongoing information.

2. Annual Monitoring Report

Within ninety (90) calendar days of the conclusion of each season's archaeological construction monitoring, the SAM for each phase of the Project shall provide to the Project Engineer and DOT&PF PQI a draft annual monitoring report that synthesizes the construction monitoring activities. The report will detail the overall monitoring effort and locations where monitoring occurred; inadvertent discoveries made, including analysis of materials encountered and/or recovered; inadvertent effects to historic properties and graves; recommendations made to avoid or minimize effects; monitoring results analysis; and any relevant field observations.

The DOT&PF PQI shall provide each annual draft monitoring report to the PA Signatories for review and comment. PA Signatories shall have ninety (90) calendar days to review and provide written comments on the draft monitoring report to DOT&PF. As directed by USACE, DOT&PF shall address comments received during the review period and will submit a final annual monitoring report to the PA Signatories within ninety (90) calendar days following the end of the comment period.

3. Final Monitoring Report

At the conclusion of construction, the SAM shall provide the Project Engineer and the DOT&PF PQI a final report synthesizing the annual reports from each phase of the project, following the same process outlined for the annual monitoring reports described above. DOT&PF shall submit one final report synthesizing the annual monitoring reports (all annual monitoring reports will be attached as an appendix) to the PA Signatories within one (1) year after completion of all archaeological construction monitoring for the duration of the Project and prior to the conclusion of this PA. Signatories will have a ninety (90) calendar day review period to provide written comments to DOT&PF. DOT&PF shall review and incorporate comments from the Signatories into the final annual monitoring report as appropriate. DOT&PF will distribute the final annual monitoring report within sixty (60) calendar days following the end of the comment period.

Appendix C
Cultural Resources Discovery Plan

I. Purpose and Scope

This *Cultural Resources Discovery Plan* (Discovery Plan) describes the general procedures and protocols for coordination in the event of an inadvertent discovery of cultural resources during the construction of the King Cove to Cold Bay Road (Project). The Discovery Plan outlines procedures to be followed if previously unidentified cultural resources are encountered after the Section 106 process has been completed or if inadvertent effects to historic properties occur during Project construction.

The Discovery Plan is intended to address typical cultural resources that are most likely to be discovered during ground-disturbing activities. Discoveries can also take other forms, including activities that go beyond permitted boundaries and encroach upon a historic property or an unevaluated site, and/or activities that cause unexpected additional effects (physical, visual, audible, or atmospheric effects) to a historic property.

II. Cultural Resources and Historic Properties

For the purposes of this document, cultural resources are defined as physical evidence of past human activity equal to or greater than fifty (50) years of age, including archaeological sites, sacred objects, features, artifacts, landscapes, and structures; buildings; plant and animal remains; sacred sites; items of cultural patrimony; and human remains. Specific examples of cultural resources that may be found in the Project area include round or rectangular structural pit features, basketry, projectile points, stone tools, hearths, grinding rock features, concentrations of human modified bone, horn and antler, beads, cache pits, fire-cracked rock, pottery, shell ornaments, cultural landscape features, culturally modified trees, building foundations, mining features, farming and homesteading features, glass bottles, ceramics, metal artifacts, and tin cans. Although "cultural resources" is not a term used in Section 106, the term is used in the Programmatic Agreement (PA) and its appendices to describe (as the PA outlines) stipulations that deal with cultural resources that have not yet been evaluated or found to be eligible for the National Register of Historic Places (National Register). Visible indications of cultural resources may be observed during construction in backhoe trenches, spoil piles, cleared ground surfaces, and vegetation.

In accordance with Section 106 of the National Historic Preservation Act, historic properties are any prehistoric or historic district, site, building, structure, object, or traditional cultural property included in or eligible for inclusion in the National Register (36 Code of Federal Regulations [CFR] 800.16(l)(1)). In other words, a historic property is a cultural resource that has been determined to be eligible for listing in the National Register.

III. Human Remains and Objects of Cultural Patrimony

A. If human remains, including cremated human remains, are encountered, treat them with dignity and respect and follow the protocols outlined in PA Stipulation IX, *Treatment of Human Remains* and Appendix D, *Human Remains Protocol*.

B. Should any associated or unassociated funerary objects, sacred objects, or objects of cultural patrimony as defined by the Native American Graves Protection and Repatriation

Act (NAGPRA; 25 United States Code 3001 et seq.) be encountered, the Alaska Department of Transportation and Public Facilities (DOT&PF) shall immediately notify all PA Signatories and proceed in accordance with Stipulation IX, *Treatment of Human Remains,* Appendix D, *Human Remains Protocol,*

IV. Professional Qualifications and Standards

Cultural resources investigations conducted under the terms of the Discovery Plan will be carried out by or under the direct supervision of a person or persons meeting at a minimum the Secretary of the Interior's (SOI's) *Professional Qualifications Standards* (36 CFR 61, Appendix A) with expertise in the appropriate field(s). Additionally, all documentation, evaluation, treatment, and reporting of cultural resources as described for these procedures will follow and meet current professional standards and the SOI *Standards and Guidelines for Archaeology and Historic Preservation* (48 *Federal Register* [FR] 44716).

V. Prior to Construction Activities

Though a project site may have been thoroughly investigated for cultural resources prior to any construction activities, there is always the possibility that unanticipated cultural resources and/or human remains will be inadvertently discovered or historic properties inadvertently affected during ground-disturbing activities. In the event that buried cultural deposits and/or human remains are inadvertently discovered or historic properties inadvertently affected during Project activities, work must stop immediately at the discovery site until a professional archaeologist can determine the nature of the discovery or effects and consult with the Signatories to the PA.

Prior to any on-site Project activities, particularly ground-disturbing activities, construction personnel and any contractors will be briefed by DOT&PF on procedures to follow if buried human remains or cultural resources are encountered or historic properties are affected. Please refer to Appendix B, *Archaeological Monitoring Plan,* of the PA for detailed information on cultural resources awareness training for construction personnel and subcontractors.

VI. Protocols at the time of Discovery of Cultural Resources or Effects to Historic Properties

The steps outlined below will be taken by the appropriate responsible parties in the event that unanticipated cultural resources are encountered or affected.

A. On-Site Construction Contractor Responsibilities

Step 1: Stop Work at a Discovery Site. If a cultural resource is inadvertently discovered or historic property is affected during the Project, ground-disturbing activities will be halted, and a buffer of no smaller than two hundred (200) feet (sixty one [61] meters) in diameter, unless otherwise prevented by ground conditions, will be established around the discovery to ensure that the integrity of the find is not compromised and to ensure safety of archaeological staff investigating the find. If an SOI-qualified archaeologist[5] is on site, they may expand this area to provide additional working areas or added margin for safety as deemed necessary in consultation with the on-site Construction Supervisor. The SOI-qualified archaeologist shall request fencing or other materials to define the boundary of the buffer area and/or to protect the discovery.

If no SOI-qualified archaeologist is present when the cultural resource is discovered or historic property affected, the Construction Contractor shall be responsible for securing and protecting the discovery and cease all work within a minimum two hundred (200)-foot (sixty one [61]-meter) buffer, unless otherwise prevented by ground conditions. Exposed cultural resources will be covered for protection. The location of the cultural resource will not be revealed to the public or any other unauthorized personnel. Modern artifacts and/or sites younger than 1976 or fifty (50) years of age do not need to be documented for the purposes of Section 106. However, this assessment needs to be made by a SOI-qualified professional. If a SOI-qualified professional is not available for an on-site assessment, then photographs of the discovery shall be sent to the DOT&PF PQI and SHPO for a professional opinion.

Construction activities may continue elsewhere in the Project area outside of the avoidance area. No further work may be conducted at the discovery site until the DOT&PF Project Engineer provides authorization to resume Project construction activities. DOT&PF shall be responsible for enforcing that no vehicles, equipment, and unauthorized personnel be permitted to traverse the inadvertent discovery or affected historic property.

Step 2: Notify the DOT&PF Project Engineer. The SOI-qualified archaeologist or the Construction Contractor shall immediately notify the DOT&PF Project Engineer regarding the inadvertent discovery or effect to a historic property. If the Project Engineer cannot be reached, the Construction Contractor shall contact the DOT&PF Professionally Qualified Individual (PQI) and/or the Regional Environmental Manager (REM). DOT&PF staff shall make all other calls and notifications.

[5] The SOI-Qualified Archaeologist may be the DOT&PF Professionally Qualified Individual (PQI) or may be a qualified consultant under contract with DOT&PF or the Construction Contractor. The Project Engineer and the PQI shall coordinate to procure cultural resources services for the investigation and documentation of the discovery.

B. DOT&PF Project Engineer Responsibilities

Step 1: Ensure Protection of Discovery Site. The DOT&PF Project Engineer is responsible for taking appropriate steps to protect the discovery site. All work will stop in an area adequate to provide for the security, protection, and integrity of the cultural resource consistent with the Agreement.

Step 2: Direct Construction Elsewhere from Discovery Site. The DOT&PF Project Engineer may direct construction away from cultural resources to work in other areas prior to completing notification.

Step 3: Notify the DOT&PF Central Region REM and PQI. The DOT&PF Project Engineer shall immediately notify the DOT&PF Southcoast Region REM and PQI with the location and all pertinent details regarding inadvertent discoveries or effects.

C. DOT&PF PQI and USACE Responsibilities

Step 1: Identify Discovery. The REM and PQI will pass all information on to USACE to implement the process. The PQI shall coordinate with the DOT&PF Project Engineer to ensure that a SOI-qualified archaeologist examine the discovery to determine if it is a cultural resource or assess the effects to the historic property.

- If USACE determines that it is not a cultural resource or that no effects occurred to a historic property, the USACE shall notify the DOT&PF Project Engineer, and work may proceed with no further delay.
- If USACE determines that it is a cultural resource, including a human remains discovery, or if effects to a historic property have occurred, the USACE shall notify the DOT&PF Project

  Engineer. No Project activities may occur at the discovery site until the USACE provides the Project Engineer with approval to resume activities. PA Appendix D, *Human Remains Protocol*, will be followed, as applicable.

Step 2: Notify PA Signatories and Other Consulting Parties. The USACE shall notify the PA Signatories and other consulting parties, as appropriate, each time there is an inadvertent discovery or affect to a historic property. The USACE shall be responsible for contacting these parties within forty-eight (48) hours of the discovery, consistent with 36 CFR 800.13(b)(3).

The USACE shall be the point of contact for all consultation with the PA Signatories and other consulting parties, as appropriate, each time there is an inadvertent discovery or effect to a historic property to ensure that the previously unidentified resource or unanticipated effect is evaluated.

VII. Documentation of the Discovery

A. Documentation

The PQI and SOI-qualified archaeologist shall ensure the proper documentation and assessment of inadvertently discovered or affected historic property in consultation with the Signatories and other consulting parties each time an inadvertent discovery or adverse effect occurs.

1. The PQI or the SOI-qualified archaeologist shall record relevant cultural material at the discovery site in accordance with professional standards. Site overviews, features, and artifacts will be photographed, and stratigraphic profiles and soil/sediment descriptions will be prepared for subsurface exposures. Inadvertent discoveries or affected historic properties will be documented on scaled site plans and site location maps. Inadvertent discoveries or affected historic properties will be recorded using GPS units with sub-meter recording capabilities. Subsurface testing may be conducted through test probes to determine the extent of subsurface deposits or to delineate boundaries as necessary.

2. All artifacts collected from the surface and test probes will be analyzed and catalogued. Artifacts will be curated in accordance with PA Stipulation XI, *Curation and Records Management*.

3. Within five (5) business days of concluding fieldwork, the SOI-qualified archaeologist shall provide the PQI and DOT&PF Project Engineer a summary memorandum describing the documentation of inadvertent discoveries or affected historic properties,and management recommendations. DOT&PF shall consult with the PA Signatories and other consulting parties on the summary findings.

4. The SOI-qualified archaeologist shall produce a technical report, consistent with the SOI *Standards and Guidelines for Archaeological Documentation* (48 FR 44734–44737) and the State of Alaska Office of History and Archaeology *Standards and Guidelines for Investigating and Reporting Archaeological and Historic Properties in Alaska*, describing the documentation of inadvertent discoveries or affected historic properties and the resultant cultural resources investigation, and provide the report to the PQI. The PQI shall consult with the PA Signatories and other consulting parties on the report findings as appropriate.

5. If it is determined in consultation between the PA Signatories and other consulting parties that the discovery is not eligible for inclusion in the National Register or effects did not occur to a historic property, no further analysis is warranted, and the DOT&PF Project Engineer may authorize construction activities to resume at the discovery site.

VIII. Evaluation and Treatment

The PQI and SOI-qualified archaeologist shall ensure that any evaluation and treatment of inadvertent discoveries or affected historic properties occur in consultation with the PA Signatories and other consulting parties.

A. In the event that inadvertent discoveries or affected historic properties cannot be avoided by Project activities, they will be treated as adversely affected by the Project in consultation with the PA Signatories. DOT&PF shall notify Signatories of the inadvertent discovery or affected property and that the property is being treated as adversely affected. DOT&PF shall develop a Treatment Plan specific to the site, in consultation with the PA Signatories, to treat the historic property. Signatories will have two (2) business days to respond to

USACE's notification, after which USACE will provide direction to DOT&PF on how to proceed.

B. Should data recovery or other on-site documentation be required, it will be implemented prior to any continued construction at the discovery site.

1. All artifacts collected as part of the treatment plan will be curated in accordance with PA Stipulation XI, *Curation and Records Management*.

2. Once data recovery activities or other on-site documentation are complete, the USACE shall coordinate with the DOT&PF Project Engineer and the PA Signatories on the authorization for construction activities to resume at the discovery site.

IX. Proceeding with Construction

Project construction outside the discovery site may continue as directed by the DOT&PF Project Engineer and Construction Contractor while documentation and assessment of the inadvertent discoveries or affected historic properties at the discovery site proceeds. When the USACE ensures that the protocols outlined in this Discovery Plan have been followed and that compliance with State and federal cultural resources laws has been completed, the DOT&PF Project Engineer may allow construction at the discovery site to resume.

Appendix D
Human Remains Protocol

I. Purpose and Scope

The following documentation describes the general procedures and protocols for coordination in the event of an inadvertent discovery of human remains under the Programmatic Agreement ("Agreement") among the Alaska Department of Transportation and Public Facilities (DOT&PF), the Alaska State Historic Preservation Officer (SHPO), and the United States Army Corps of Engineers (USACE), regarding the King Cove to Cold Bay Road (Project).

II. Human Remains

Human remains refer to the body of a deceased person, in whole or in parts, regardless of its stage of decomposition, and cremated remains. Cremated remains are generally ash but can include bone and teeth fragments. Visible indications of human remains may be observed during ground-disturbing activities.

III. Professional Qualifications and Standards

Work under the terms of this *Human Remains Protocol* will be carried out by or under the direct supervision of a person or persons qualified as a biological/physical anthropologist or archaeologist with training in biological/physical anthropology and experience in the evaluation of human remains. The archaeologist must also meet the minimum requirements under the Secretary of the Interior's (SOI's) *Professional Qualifications Standards* (36 Code of Federal Regulations 61, Appendix A; SOI-qualified Archaeologist). Additionally, all documentation, evaluation, treatment, and reporting associated with a human remains discovery will follow and meet current professional standards, including, but not limited to, the SOI's *Standards and Guidelines for Archaeology and Historic Preservation* (48 *Federal Register* 44716).

IV. Protocols at the time of Discovery of Human Remains

In the event that unanticipated human remains are encountered, the appropriate responsible parties shall take the steps outlined below.

A. On-Site Construction Contractor Responsibilities

Step 1: Stop Work at a Discovery Site. If human remains are inadvertently discovered during the Project, all work that may further disturb the human remains will cease immediately within a minimum two hundred (200)-foot (sixty-one [61]-meter) radius of the discovery. In the event that an archaeological monitor is not present, the discovery site is to be secured and protected by the Construction Contractor or Subcontractor until the DOT&PF

Project Engineer and/or the DOT&PF Professionally Qualified Individual (PQI)[1] can assume responsibility. **All human remains, including cremated human remains, will be treated with dignity and respect at all times.** All remains identified through inadvertent discovery will be treated as human until a qualified anthropologist/archaeologist can make a determination. Human remains will be covered for protection. No further work may be conducted at the discovery site until the DOT&PF Project Engineer provides authorization to resume Project construction activities. DOT&PF shall be responsible for enforcing that no vehicles, equipment, or unauthorized personnel be permitted to traverse the discovery site.

Step 2: Notify the DOT&PF Project Engineer. The Construction Contractor shall immediately notify the DOT&PF Project Engineer regarding the discovery. If the Project Engineer cannot be reached, the Construction Contractor shall contact the PQI and/or the Regional Environmental Manager (REM). DOT&PF staff will provide notice to USACE as soon as practicable, who will make all other calls and notifications.

B. DOT&PF Project Engineer Responsibilities

Step 1: Ensure Protection of Discovery Site. The DOT&PF Project Engineer is responsible for taking appropriate steps to protect the discovery site. All work will stop in an area adequate to provide for the security, protection, integrity, and dignity of the human remains.

Step 2: Notifications. The DOT&PF Project Engineer shall immediately notify the DOT&PF Southcoast Region REM and/or PQI with location and all pertinent details regarding the discovery. The DOT&PF Project Engineer and the PQI shall immediately notify the USACE, who will provide information about the discovery to the following parties:

- Alaska State Troopers (AST),
- State Medical Examiner (SME),
- SHPO,
- King Cove Corporation and Agdaagux Tribe of King Cove,
- USACE,
- Consulting parties

See Appendix E of the Agreement for specific contact information for agency and Tribal officials involved with human remains notifications. The USACE will be the primary point of contact for the Agreement Signatories.

[1] The PQI is an SOI-qualified DOT&PF Cultural Resources Specialist.

Step 3: Direct Construction Elsewhere from Discovery Site. The DOT&PF Project Engineer may direct construction away from the discovery site to other areas after contacting the discovery notification consulting parties in Step 2.

V. Identification of the Human Remains

A. USACE and DOT&PF shall defer to local law enforcement, the AST, and/or the SME for a determination of whether the remains are of a forensic nature and/or subject to criminal investigation.

B. If the AST and/or SME determine that the remains are neither of a forensic nature nor subject to a criminal investigation, a qualified biological/physical anthropologist or SOI-qualified archaeologist with training in biological/physical anthropology and experience in the analysis of human remains shall examine the human remains to determine biological affinity.[2] The anthropologist/archaeologist shall be the responsible party for securely transporting the remains to their analysis site if warranted.[3] The anthropologist/archaeologist shall provide USACE with information regarding their facility storage and security protocols prior to transport to ensure adequate and sensitive treatment of the remains. The anthropologist/archaeologist shall document, analyze, and photograph the remains so that an independent assessment of biological affinity can be made. USACE shall consult with the Signatories on facility storage, security, analysis methods, place of analysis, and reporting of analysis to ensure that all are carried out in a culturally appropriate manner. The anthropologist/archaeologist shall be afforded ninety (90) days to conduct their analysis and provide a written report of findings to USACE. The Signatories will be afforded ninety (90) days to review and provide written comments to USACE on the anthropologist/archaeologist's report.

C. If the anthropologist/archaeologist makes a determination that the remains are not of Native origin and the AST and the SME make a determination that a death investigation is not warranted, then USACE, in consultation with the SME, shall attempt to identify, locate, and consult with descendants of the deceased. If no descendants are found, any necessary permits from the Alaska State Bureau of Vital Statistics will be obtained and the remains re-interred in a designated area to be determined with the landowner or land-managing agency associated with the property on which the remains were discovered.

D. If the anthropologist/archaeologist makes a determination that the remains are of Native origin, and the AST and the SME make a determination that a death investigation is not warranted, then USACE shall consult in accordance with the protocol described in this document, in Agreement Stipulation IX, *Treatment of Human Remains*.

[2] The DOT&PF Project Engineer and PQI shall coordinate to procure the services of a SOI-qualified anthropologist/archaeologist for the analysis and documentation of the human remains discovery.

[3] Prior to the removal of the remains, DOT&PF shall coordinate with the Signatories on any blessing ceremonies to be performed at the discovery site.

VI. Consultation

A. If the human remains are inadvertently discovered during Project activities, the PQI shall notify the Signatories within twenty-four (24) hours and expeditiously consult on the treatment and disposition of such remains.

B. Should any associated or unassociated funerary objects, sacred objects, or objects of cultural patrimony as defined by the Native American Graves Protection and Repatriation Act (NAGPRA; 25 United States Code [USC] 3001 et seq.) be encountered, DOT&PF shall immediately notify the landowner or land-managing agency and all Signatories and proceed in accordance with Agreement Stipulation X, *Inadvertent Discoveries and Unanticipated Effects*, and Appendix C, *Cultural Resources Discovery Plan*.

VII. Proceeding with Construction

A. Project construction outside the human remains discovery site may continue as directed by the DOT&PF Project Engineer and Construction Contractor while documentation and assessment of the human remains at the discovery site proceed.

B. When the PQI ensures that the protocols outlined in this plan have been followed and that compliance with State and federal cultural resources laws has been completed, the DOT&PF Project Engineer may allow construction at the discovery site to resume.

VIII. Federal and State Regulations Regarding Human Remains

USACE and DOT&PF shall also adhere to State laws and protocols in accordance with Alaska Statute (AS) 11.46.482(a)(6), AS 12.65.5, AS 41.35.200, and AS 18.50.250 pertaining to the discovery of human remains within the state of Alaska. State (Alaska Statute) Laws

1. ***AS 11.46.482(a)(3):*** Applies to <u>all</u> lands in Alaska; makes the "intentional and unauthorized destruction or removal of any human remains or the intentional disturbance of a grave" a Class C felony.

AS 12.65.5: Requires immediate notification of a peace officer of the State (police, Village Public Safety Officer, or AST) and the SME when death has "been caused by <u>unknown</u> or criminal means, during the commission of a crime, or by suicide, accident, or poisoning." The AST has interpreted notification procedures as applicable to all remains, including ancient remains. In addition to a local peace officer (if within a local jurisdiction), notification should include the AST Criminal Investigation Bureau.

2. ***AS 41.35.200:*** Applies only to <u>State</u> lands; makes the disturbance of "historic, prehistoric and archeological resources" (including "graves") a Class A misdemeanor.

3. ***AS 18.50.250:*** Requires the issuance of burial-transit and disinterment and re-interment permits by the State Registrar of Vital Statistics or an authorized local registrar under certain circumstances.

A. Federal (United State Code) Laws

1. ***16 USC 470 (ARPA):*** Prohibits the unauthorized destruction or removal of archaeological materials, including human remains (i.e., more than 100 years old) on federal lands and federal trust lands. A violation may be prosecuted as a misdemeanor or felony, as warranted by the severity of the violation. Violations of State or local laws, regardless of land ownership, may be prosecuted under ARPA if the archaeological materials are transported across state boundaries.

2. ***25 USC 3001 et seq. (NAGPRA):*** Governs the treatment and disposition of human remains on federal or federal trust lands that are determined to be Native American. NAGPRA also applies to Native American human remains from any lands if the remains are curated in an institution that receives federal funds.

Appendix E
Contact Information for Agency and Tribal Officials

State Medical Examiner
Operations Administrator 4500
South Boniface Parkway
Anchorage, AK 99508-1264
Phone: (907) 334-2202
Fax: (907) 334-2216

Alaska State Troopers
Missing Persons Clearinghouse
5700 East Tudor Road
Anchorage, AK 99507
Phone: (907) 269-5038
Fax: (907) 337-2059

Alaska Bureau of Vital Statistics
Section Chief
Supervisor of the Anchorage Bureau 3601
C Street, Suite 128
Anchorage, AK 99503
Phone: (907) 465-8643
Fax: (907) 465-4689

U.S. Army Corps of Engineers
South Branch Chief
PO Box 6898
JBER, AK 99506-0898
Phone: (907) 753-2712
Fax: (907) 753-5567

Department of Transportation and Public Facilities
Southcoast Region Environmental Manager
P.O. Box 112506
Juneau, AK 99811
Phone: (907)465-4509
Fax: (907)465-2016

Southcoast Region Cultural Resources
Specialist/PQI
P.O. Box 112506
Juneau, AK 99811
Phone: (907)799-4845
Fax: (907)465-2016

Office of History and Archaeology State
Historic Preservation Office 550 West 7th
Avenue, Suite 1310
Anchorage, AK 99501
Phone: (907) 269-8700

DOT&PF Liaison
550 West 7th Avenue, Suite 1310
Anchorage, AK 99501
Phone: (907) 269-8944

King Cove Corporation
Chief Executive Officer
P.O. Box 38
King Cove, AK 99612
Phone: (907) 497-2648

Agdaagux Tribe of King Cove
Tribal President
P.O. Box 249
King Cove, AK 99612
Phone: (907) 497-2648
Fax: (907) 279-8836

U.S. Fish and Wildlife Service
Regional Director
1011 East Tudor Road
Anchorage, AK 99503
Phone (907) 786-3856

Aleutian Pribilof Islands Association
1311 East International Airport Road
Anchorage, AK 99518
Phone: (907) 276-2700
Fax: (907)279-4351

Qagan Tayagungin Tribe of Sand Point Village
PO Box 447
Sand Point, AK 99661
Phone: (907) 383-5616
Fax: (907) 383-5814

Qawalangin Tribe of Unalaska
Tribal President
P.O. Box 334
Unalaska, AK 99685
Phone: (907) 581-2920
Fax: (907) 581-3644

Native Village of Akutan

Tribal President
P.O. Box 89
Akutan, AK 99553
Phone: (907) 698-2300
Fax: (907) 698-2301

Native Village of Nelson Lagoon
Tribal President
913 S. Main Street, Box 913
Nelson Lagoon, AK 99571
Phone: (907) 989-2204
Fax: (907) 989-2233

Native Village of False Pass
Tribal President
P.O. Box 29
False Pass, AK 99583
Phone: (907) 548-2227
Fax: (844) 206-9004

SELF-CERTIFICATION STATEMENT OF COMPLIANCE

Permit Number: POA-2010-00286, King Cove to Cold Bay Road Project

Permittee's Name & Address (please print or type):______________________________________

____

____

Telephone Number:____

Location of the Work:____

____

Date Work Started:______________________ Date Work Completed:________________________

PROPERTY IS INACCESSIBLE WITHOUT PRIOR NOTIFICATION: YES ______ NO_______
TO SCHEDULE AN INSPECTION PLEASE CONTACT ________________________________
AT ____________________________

Description of the Work (e.g. bank stabilization, residential or commercial filling, docks, dredging, etc.):____

____

____

Acreage or Square Feet of Impacts to Waters of the United States: ________________________

Describe Mitigation completed (if applicable): ____

____

____

Describe any Deviations from Permit (attach drawing(s) depicting the deviations):

____

____

I certify that all work and mitigation (if applicable) was done in accordance with the limitations and conditions as described in the permit. Any deviations as described above are depicted on the attached drawing(s).

____
Signature of Permittee

____
Full Name of Permittee (printed or typed)

____
Date