

National Park Service
U.S. Department of the Interior

Lake Clark National Park and Preserve
Alaska Region



Lake Clark National Park and Preserve Johnson Tract Transportation and Port Easements *Resource Analysis*

October 2024





As the nation's principal conservation agency, the Department of the Interior has responsibility for most of our nationally owned public lands and natural and cultural resources. This includes fostering the wisest use of our land and water resources, protecting our fish and wildlife, preserving the environmental and cultural values of our national parks and historical places, and providing for enjoyment of life through outdoor recreation. The department assesses our energy and mineral resources and works to assure that their development is in the best interests of all. The department also has a major responsibility for American Indian reservation communities and for people who live in island territories under U.S. administration.

ON THE COVER

View of Bear Valley from Tuxedni Channel.

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ACRONYMS AND ABBREVIATIONS

1976 Act	Cook Inlet Land Exchange
ADFG	Alaska Department of Fish and Game
ANCSA	Alaska Native Claims Settlement Act
ANILCA	Alaska National Interest Lands Conservation Act
AWC	Anadromous Waters Catalog
CFR	Code of Federal Regulations
CIRI	Cook Inlet Region, Inc.
DOI	Department of the Interior
ESA	Endangered Species Act of 1973
FR	Federal Register
GMU	Game Management Unit
GPS	global positioning system
NMFS	National Marine Fisheries Service
NPS	National Park Service
NRHP	National Register of Historic Places
O&M	Operations and Maintenance
Park	Lake Clark National Park
PCE	primary constituent element
RA	Resource Analysis
Secretary	Secretary of the Interior
U.S.C.	U.S. Code
USFWS	U.S. Fish and Wildlife Service

1 INTRODUCTION

1.1 INTRODUCTION

The National Park Service (NPS) has prepared this Resource Analysis (RA) to evaluate proposed easements needed to provide access to the Johnson Tract within Lake Clark National Park (Park). The NPS conveyance of these potential easements is referred to as the Project.

1.2 BACKGROUND

1.2.1 Summary

The Alaska Native Claims Settlement Act (ANCSA) was enacted in 1971 to settle aboriginal land title claims with Alaska Natives. Cook Inlet Region Inc. (CIRI) was not able to receive its full entitlement because much of the quality land in Southcentral Alaska was already claimed by the State of Alaska, the federal government, local communities, and private interests. Through litigation and a subsequent negotiation process with the Department of the Interior (DOI) and the State of Alaska, the Cook Inlet Land Exchange was passed by Congress and signed by the President in 1976 (1976 Act) in support of fulfilling CIRI's ANCSA land entitlement.

As part of the 1976 Act, CIRI relinquished ANCSA land selections around Lake Clark and in exchange received the 20,942-acre Johnson Tract, a known mineral prospect at the head of the Johnson River. The Johnson Tract consists of two smaller tracts: the 11,342 acre South Tract and the 9,600 acre North Tract.

The 1976 Act specified that the Secretary of the Interior (Secretary) shall convey two easements—a transportation easement and a port easement—across what would become Lake Clark National Park. The easements are to allow for the transportation and shipping of minerals extracted from the Johnson Tract. The 1976 Act requires that the Secretary and CIRI mutually agree upon the location of these two easements.

In 2019, CIRI and JT Mining, Inc. (formerly HighGold Mining Inc. [HighGold] prior to merging with Contango Ore, Inc.), entered into a 10-year lease of the Johnson Tract for mineral exploration. In 2020, HighGold began working with NPS for authorization to access the North Tract for certain activities associated with their mineral exploration. In January of 2023, CIRI began discussions with NPS to advance the conveyance of the transportation and port easements. On June 26, 2024, Cook Inlet Region Inc. (CIRI) requested conveyance of the easements and provided an Environmental Information Document (EID), appendices, and cover letter as part of its request (CIRI 2024).

1.2.2 History

1.2.2.1 ANCSA

ANCSA, the largest land claims settlement in U.S. history, became law on December 18, 1971, and was intended to resolve long-standing issues surrounding aboriginal land claims in Alaska, as well as to stimulate economic development. ANCSA extinguished Alaska Native aboriginal land claims in exchange for providing Alaska Natives with 44 million acres of land and nearly \$1 billion. ANCSA also established 12 regional and nearly 200 village corporations, which

became owners of land other interests conveyed under ANCSA. CIRI is one of those 12 regional corporations.

1.2.2.2 Cook Inlet Land Exchange

The 1976 Act or Cook Inlet Land Exchange (Public Law 94-204 and Public Law 94-456, as amendments to ANCSA) was a three-way land exchange between the federal government, the State of Alaska, and CIRI. When ANCSA was passed in 1971, much of the land in southcentral Alaska was already State or privately owned or subject to a federal withdrawal, which meant that the use of the land was restricted while the DOI determined how the lands should be appropriated. CIRI was not satisfied with its land selections and sued the DOI in 1973. After this litigation and resulting negotiations, the State, the federal government, and CIRI agreed to the Cook Inlet Land Exchange, which was ratified as to the duties and obligations of the United States and [CIRI], as a matter of Federal law by the 1976 Act. The 1976 Act accomplished several things—it allowed the federal government to accommodate CIRI's ANCSA entitlement and expanded CIRI's lands to include selections that had mineral potential. Through the 1976 Act, CIRI relinquished ANCSA land selections around Lake Clark in support of the establishment of what would become Lake Clark National Park and Preserve.

As part of the exchange, CIRI received the Johnson Tract. For the North Tract (9,600 acres), the 1976 Act specified that CIRI receive only “the rights to metalliferous minerals”. The surface estate of the North Tract is managed by the NPS. For the South Tract (11,342 acres), the 1976 Act granted CIRI the land in “fee simple” subject to “a restrictive covenant [...] providing that the surface shall only be used for purposes reasonably incident to mining and mineral extraction, including processing and transportation”.

As part of conveying the Johnson Tract, the 1976 Act requires that the Secretary shall convey to CIRI, “[...] an easement for a port which shall reasonably provide for receiving, shipping, storage, and incidental handling, and incidental facilities there to,” and, “[...] a transportation easement to provide for transportation by road, rail or pipeline,” of the minerals in the Johnson Tract. The 1976 Act also requires that the Secretary and CIRI “shall mutually agree” to the locations of these two easements. These two easements are considered ANCSA conveyances.

1.2.2.3 ANILCA

The 1980 Alaska National Interest Lands Conservation Act (ANILCA) doubled the total acreage of the U.S. National Park System and created 10 new National Park System areas, including Lake Clark National Park and Preserve. ANILCA is widely regarded as the single-largest act of conservation in U.S. history (NPS 2024a) and was considered a “win” by many as it represents a desire to balance land management in Alaska with conservation and resource development potential (NPS 2024b).

In creating Lake Clark National Park and Preserve, ANILCA Section 201 specifically states that the Park shall be managed to, “[...] *protect the watershed necessary for perpetuation of the red salmon fishery in Bristol Bay; to maintain unimpaired the scenic beauty and quality of portions of the Alaska Range and the Aleutian Range, including active volcanoes, glaciers, wild rivers, lakes, waterfalls, and alpine meadows in their natural state; and to protect habitat for and populations of fish and wildlife including but not limited to caribou, Dall sheep, brown/grizzly bears, bald eagles, and peregrine falcons.*”

When ANCSA was passed in 1971 and subsequently in 1976 when the Cook Inlet Land Exchange was completed, the land surrounding the Johnson Tract was managed by the Bureau of Land Management. With the passing of ANILCA and the establishment of Lake Clark

National Park and Preserve, the land surrounding Johnson Tract became a part of Lake Clark National Park to be managed by the National Park Service.

1.2.2.4 Johnson Tract Mineral Development History

Prior Exploration and Analysis by CIRI

Since 1980, CIRI and its consultants have conducted several environmental analyses and other studies to explore potential mineral exploration in the Johnson Tract and potential transportation and port easement areas. An “Environmental Assessment” was conducted by Anaconda Mineral Company for mineral exploration of the North Tract. The assessment details four phases of work that included rock sampling, trenching, core drilling, and geologic mapping.

In 1993, CIRI conducted an “Environmental Analysis” that evaluated four transportation options from the South Tract to Cook Inlet. The options included a route down the Johnson River and to an Iliamna Point port site, and three routes to the northeast to port sites in Tuxedni Bay. CIRI consultants also completed a Johnson River Road reconnaissance study in 1992 (PND 1992) and a preliminary geotechnical and geophysical investigation in 1995 (Golder Associates 1995).

North Tract Exploration and Resource Study Permits

In 2021, NPS granted an authorization for access to HighGold (now JT Mining, Inc.), CIRI’s mineral lessee. The authorization provides access for purposes of subsurface mineral exploration of CIRI’s subsurface estate. The authorization allows for 150 days of exploratory drilling in four specific areas between June 1st and October 31st annually via helicopter until October 31, 2028. The NPS conducted an Environmental Assessment under the National Environmental Policy Act prior to issuing the authorization. In addition, the NPS has issued limited, seasonal Special Park Use permits to HighGold since 2021 in the area now proposed by CIRI for the transportation and port easements to allow JT Mining to conduct environmental studies, cultural resource surveys, and reconnaissance-level engineering field surveys.

Current CIRI Proposal

On June 26, 2024, CIRI submitted to NPS two proposed deeds, one for the transportation corridor and one for the port. In addition, they submitted an Environmental Information Document (EID) to facilitate DOI’s preparation of a Resource Analysis. The EID contains resource studies and data previously gathered by the NPS and data collected by CIRI and its consultants. The EID notes the easements proposed by CIRI are “intentionally broad to accommodate additional forthcoming engineering and environmental information that will instruct the specific location of the transportation route and port site within the broader easement area.” CIRI also makes clear “no specific mine, road, rail line or port sites are being proposed as part of CIRI’s current actions, and there is considerable uncertainty whether a mine, road, rail line or port will be constructed in the future” (2024, pg. 2.1).

1.3 INDIGENOUS KNOWLEDGE

In response to Secretarial Order 3403, the NPS Alaska Region is committed to incorporating Indigenous Knowledge gathered and shared during Tribal consultation and public review into environmental analysis documents. NPS is charged with the highest trust responsibility to protect Tribal interests and further nation-to-nation relationships with Indian and Alaska Native Tribes, to pursue an open and collaborative relationship with Tribes, and to provide

access to Park resources and places so Tribes can maintain their cultural and spiritual practices. NPS also recognizes and respects that some information may be sacred to Tribal interests and should remain confidential.

For this portion of the RA, NPS uses the following definition of Indigenous Knowledge: “Indigenous Knowledge is a body of observations, oral and written knowledge, innovations, practices, and beliefs developed by Tribes and Indigenous Peoples through interaction and experience with the environment [...] Indigenous Knowledge is based in ethical foundations often grounded in social, spiritual, cultural, and natural systems that are frequently intertwined and inseparable, offering a holistic perspective” (CEQ 2022).

There are Dena’ina, Ahtna, and Sugpiaq place names in the Johnson Tract area, which indicates cultural significance and traditional use. In the Dena’ina language, Tuk’ezitnu Hdakaq’ (Tuxedni Bay) translates to, “is killed in water stream mouth” or “fish stranded in tide river.” Ringsmuth’s (2005:9) research found that Tuxedni was once known as Tukuzit, “a place to land” in Dena’ina. Talin Ch’iltantnu translates to, “where we found a whale stream,” and Tsanitnu Hdakaq’ translates to, “rock cliff stream mouth,” in the Dena’ina language. These place names, along with those in Table 1-1, document subsistence practices, travel routes, historical events, and the terrestrial and maritime environment of the area.

Table 1-1 Lake Clark National Park and Preserve Indigenous Coastal Place Names

Indigenous Name	Meaning	Language	Geographic Feature	English Name and/or Description
Tsetneltsiicde	Where rock is ochre colored	Ahtna	Mountain	Mountain to the west of Tuxedni Bay
Tubaaghe 'Ane'	Beyond the beach	Ahtna	Inlet	Lower Cook Inlet
Batsaqil'in	One that has rock in it	Dena'ina	Hill	Polly Creek area
Bentudush Bena	High-tide lake	Dena'ina	Lake	Lake and marsh at mouth
Ch'it'en Bena	Shaded lake	Dena'ina	Lake	Crescent Lake
Ch'it'entnu	Shaded stream	Dena'ina	Stream	Crescent River
Chuq'eyghet	At the birch	Dena'ina	Ancestral Site	Site at mouth
Esnitnu	Cottonwood stream	Dena'ina	Stream	First or Second creek north of Polly Creek
Naqazhegi	Carved around it	Dena'ina	Island	Chisik Island, Snug Harbor
Talin Ch'iltantnu	Where we found a whale stream	Dena'ina	Stream	Polly Creek
Talin Ch'iltant	Where we found a whale	Dena'ina	Ancestral Site	Polly Creek site
Tuk'ezitnu	Is killed in water stream	Dena'ina	Stream	Tuxedni River

Indigenous Name	Meaning	Language	Geographic Feature	English Name and/or Description
Tuk'ezitnu Hdakaq'	Is killed in water stream mouth	Dena'ina	Bay	Tuxedni Bay

Sources: Leer 1980, Smith and Kari 2023

Brian Fagan's (2008) publication summarizes petroglyph sites at Tuxedni Bay and Clam Cove and additional ancestral sites recorded at Chinitna and Tuxedni Bays. Transcriptions from Laurel Bennett from the 1990s also recount a possible gravesite near Polly Creek. Frederica de Laguna's (1975) book on Cook Inlet archaeology includes two Indigenous knowledge highlights. One highlight is on the use of oil shale, accessible from Iniskin Bay to Fossil Point, by ancestral Sugpiat for making labrets. The other highlight mentions the possibility that the origin place of the Dena'ina Tulchina Clan is at Polly Creek. Stanek et al (2006) has further significant Indigenous knowledge on the Polly Creek area that covers the origins of the Dena'ina name for Polly Creek, shamanism, and daily life. This limited summary of Indigenous knowledge highlights the area's importance to the Dena'ina people and indicates that more research could be done to document cultural places that Tribes may find significant. Additional information on tribal consultation for this Project can be found in Section 4.2.

1.4 INTENT AND OBJECTIVES

The intent for this analysis is to evaluate the environmental consequences of conveying easements pursuant to the 1976 Act. This Resource Analysis (RA) will inform the selection of a "mutually agree[able]" transportation easement and port easement location as well as terms and conditions for the easements that best protect Park resources consistent with the NPS mission (NPS Organic Act), Park enabling legislation and purposes (ANILCA Section 201).

NPS is preparing an RA rather than a NEPA document because ANILCA Section 910 addresses ANCSA conveyances and their relationship to the National Environmental Policy Act of 1969 (NEPA) by stating:

The National Environmental Policy Act of 1969 (83 Stat. 852) shall not be construed, in whole or in part, as requiring the preparing or submission of an environmental impact statement for withdrawals, conveyances, regulations, orders, easement determinations, or other actions which lead to the issuance of conveyances to Natives of Native Corporations pursuant to the Alaska Native Claims Settlement Act, or this Act.

Congress mandated that the conveyances of the easements "shall be considered and treated as conveyances under [ANCSA]," Section 12(c) of Pub. L. 94-204, and are therefore undertaken in partial fulfillment of CIRI's entitlements under ANCSA. Conveyance of the easements is subject to section 910 of ANILCA, 43 U.S.C. § 1638 and a NEPA document is not required. While NPS is not conducting a NEPA analysis for this Project, some concepts and definitions from NEPA are still useful in this context. This RA borrows some concepts and definitions from NEPA as appropriate.

1.5 PROJECT AREA

The Project is located in Lake Clark National Park, outside of the Preserve, 125 miles southwest of Anchorage, Alaska, on the west side of Cook Inlet. The proposed easement areas are shown on Figure 1-1.

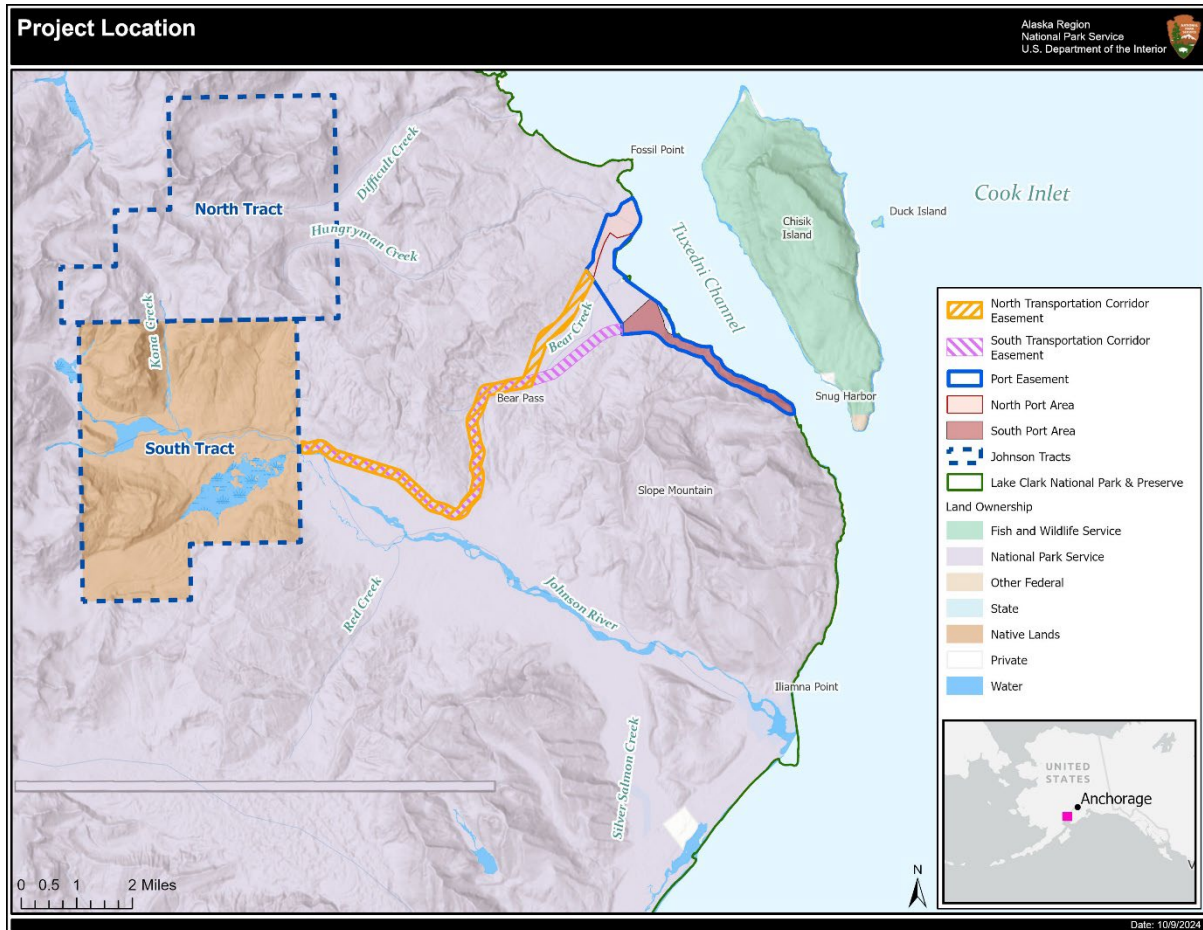


Figure 1-1. Project Location

1.6 SCOPE OF THE ANALYSIS

The Project will include three phases: (1) Planning; (2) Construction; and (3) Operations and Maintenance (O&M). As described in Section 1.2.2, the easements proposed by CIRI are “intentionally broad to accommodate additional forthcoming engineering and environmental information that will instruct the specific location of the transportation route and port site within the broader easement area.” CIRI also makes clear “no specific mine, road, rail line or port sites are being proposed as part of CIRI’s current actions, and there is considerable uncertainty whether a mine, road, rail line or port will be constructed in the future.” As such, there are currently no site-specific designs or plans for Construction and O&M of the port or rail/road, including the alignment of the road, rail, or pipeline. Planning Phase actions first need to occur to inform later design and phases of the Project.

The easements will be conveyed to authorize uses during the Planning Phase and will require an amendment, mutually agreed upon by CIRI and NPS, to move to the Construction and then O&M Phases. Though the 1976 Act allows for a transportation easement to have either a “road, rail, or pipeline,” CIRI has only proposed a road or rail, so a pipeline will not be considered in this RA.

Table 1-2 provides a description of both site-specific and broad actions within each phase of the conveyance process. The Planning Phase actions are analyzed at a site-specific level and include activities reasonably necessary to design, engineer, and permit a road or rail and port area (Section 3.0). This RA discloses and fully analyzes actions that require no additional future environmental review.

Separately, this RA broadly analyzes actions for the Construction and O&M Phases that would require additional environmental review and permitting once the scope and design for these actions are sufficiently developed (Table 1-2). This RA also discloses additional resources to consider in future phases (Section 3.0). The width of the transportation corridor and the size of the port area easement would be reduced by amendment at each Project phase as described in Table 1-2.

Table 1-2 Overview of Conveyance Process

Conveyance Phase	Specific Action	Environmental Review
Phase 1: Planning Phase Actions	Activities reasonably necessary to inform design of a road/rail and port. This includes access to the easement areas, geotechnical assessment through the drilling of boreholes, hydrology and hydraulics analysis, additional environmental and cultural resource surveys, and associated disturbance. For this phase, the transportation corridor is up to 1,000 feet in width.	Environmental review for site-specific Planning actions is covered in this RA.
Phase 2: Construction	Activities required to design and construct a road/rail and port area, including excavation, brush and tree clearing, blasting, and material and worker transportation. Transportation corridor around the centerline of the road/rail is up to 250 feet in width and may include other areas necessary for Construction activities (for example, ingress/egress and laydown yards). Port area is refined for Construction uses. A north or south transportation route and port area would be chosen before this phase begins, and the port area would be smaller than that originally proposed in the Planning Phase.	Broadly analyzed in this RA. Future site-specific environmental review and permitting would be required prior to Construction activities occurring.

Conveyance Phase	Specific Action	Environmental Review
Phase 3: Operations and Maintenance	<p>Activities that would result from the O&M of a road/rail and port, including the use of transportation easement to haul mining materials and workers and use of the port to ship or receive mining materials and workers.</p> <p>Transportation corridor around the centerline of the road/rail is up to 100 feet in width and may include other areas necessary for operation and maintenance.</p> <p>Port area is defined by as-builts for infrastructure and surrounding port area for ongoing O&M uses.</p>	<p>Broadly analyzed in this RA. Future site-specific environmental review and permitting would be required prior to O&M activities occurring.</p>

Key: O&M = Operations and Maintenance; RA = Resource Analysis

2 PLANNING, CONSTRUCTION, AND O&M ACTIVITIES AND EASEMENT AREA OPTIONS

This section describes Planning Phase activities (Section 2.1) and broad Construction and O&M activities (Section 2.2) for all action options and easement area options (Section 2.3). Easement area options include the No Action option (Option 1) and three action options that would convey easements for Planning, Construction, and O&M. The three action options are the locations proposed to address the Project's intent and objectives (Section 1.4) and effectively evaluate the environmental consequences of conveying the easements. The action options also include specific Terms and Conditions that would serve to further define the scope of activity allowed by the easements. Additionally, this section describes options that were initially evaluated but ultimately dismissed from further analysis, such as the Johnson River Route option (Section 2.4).

2.1 PLANNING PHASE ACTIVITIES - COMMON TO ALL ACTION OPTIONS (OPTIONS 2, 3, AND 4)

This RA uses the best available information to analyze site-specific Planning Phase activities. CIRI has not submitted any work plans or specific information on what activities it expects to conduct and when it might conduct them during the Planning Phase. In order to perform a robust analysis and inform appropriate Terms and Conditions for use of the easements, NPS must make reasonable assumptions of activities that can be expected to occur during the Planning Phase. NPS's assumptions regarding Planning Phase activities are based on prior correspondence, permit requests from CIRI and JT Mining, and NPS's experience with other similar projects.

During the Planning Phase, NPS anticipates that CIRI's access to and use of the easements would include preliminary engineering and geotechnical assessment through the drilling of boreholes, the digging of test pits, hydrology and hydraulics analysis, additional environmental and cultural resource surveys, and associated disturbance. CIRI's use of the easement areas would also include reclamation activities (such as backfilling any holes or trenches and natural revegetation) as detailed below and in Section 2.5.

Planning Phase activities are expected to be mostly seasonal, with activity primarily occurring from June through September. It is expected that the Planning Phase would last 4–5 years and activity may vary annually. All activities would be confined to the transportation and port areas, shown on Figure 1-1. The footprint of where these activities would occur is different among the options. Features constructed on the ground, such as helipads and drill pads, would not be permanent or long-term. No roads or other permanent infrastructure would be constructed during this phase. Potential mechanized equipment may include helicopters; drill rigs for boreholes; small power tools for cutting, drilling, and fastening used in construction of drill rig platforms; and chain saws and other power tools for removal of vegetation.

Access via air will be necessary during the Planning Phase. It is NPS's understanding that most flight operations will be based from CIRI's South Tract. However, CIRI might utilize a barge for helicopter flight operations.

During the Planning Phase, the NPS may use the Transportation Easement and Port Easement Areas or authorize the use by the public so long as such use is compatible and consistent with the Transportation and Port Easements. This right does not permit the NPS, the public, or any other party to interfere with CIRI's reasonable use of the Transportation Easement and Port Easement Areas.

NPS assumes the following activities will occur during the Planning Phase:

Pedestrian Engineering Surveys

- Ground truthing of previous reconnaissance work, including a global positioning system (GPS)-based field survey, will serve as a basis for refining the centerline for the potential transportation easement and site conditions at prospective port areas within the potential port area easement (Figure 1-1).
- The pedestrian traverse would consist of walking as much of the potential transportation easement centerline as possible. The traverse will also include site-specific assessments of stream crossings, topography, and other considerations relevant to construction.
- A 2–4-person crew would complete the pedestrian traverse/GPS survey. The estimated time to complete this effort is 8 field days with 3–4 hours of flying time via helicopter per day (total of 32 hours per year). The route traverse would occur after the snow is off and before full vegetation green-up around mid-July.
- Shallow soil test pits will be periodically hand dug with a shovel or tested with a 1-inch-diameter hand probe.

Geotechnical Drilling

- If necessary, a stable, level platform to support the drill and their associated supplies, temporary drill pads should be constructed to prevent excessive damage to the ground surface and vegetation. Pads would be constructed of wood timbers, geotextiles, or duradeck pads and placed on the ground with minimal surface disturbance. The typical footprint is 20 by 20 feet.
- Between 50 and 150 boreholes are estimated to be needed for the transportation easement and between 20 and 100 for the port easement.
- Fuel required for each drill will be transported via helicopter in fly tanks ranging in capacity from 70 to 130 gallons and will incorporate secondary containment. Drilling pads will have fuel stored in secondary containment with cumulative storage of up to 260 gallons. In the event of a spill, personnel will immediately contain the spill and spill response procedures from the spill prevention and response plan followed.,
- Drill pads will be deconstructed and the area repaired. Drill pad and helipad reclamation would take place concurrently with drilling operations. Drill pad reclamation would occur after a drill is removed from the drill pad. The drill pad would be deconstructed and moved by helicopter to the next site for reuse.
- The estimated time to complete this effort is 120 field days. It is unknown the amount of flight time needed per year as this would be dependent on the intensity of exploratory work; however, NPS is proposing Terms and Conditions for the total number of flight hours per operating season for all activities (see number 6, under Section 2.4.1.1).

Environmental and Cultural Resource Surveys

- Reconnaissance surveys would continue within the potential transportation and port easement areas (Figure 1-1). The surveys will involve archeology teams completing field

traverses that may include digging shallow pits to provide three-dimensional assessment of any cultural sites. Subsurface testing will focus on areas identified as having the potential to contain intact subsurface features or artifacts. Shovel tests will be 50 by 50 centimeters and will be excavated to a depth of 1 meter or sterile soils when possible.

- Pedestrian surveys are expected to be completed over an estimated 10-day (cumulative) period in July through September, depending on the availability of archeologists. The team that will perform the work is composed of a maximum of 4–5 people and will access sites via helicopter. Total flying time would be 2 hours per day for a total of approximately 20 hours of flying time per year.
- A programmatic agreement between NPS, the Alaska State Historic Preservation Office, and CIRI will provide further details and stipulations regarding required cultural resource protection and work for the Project.
- Hydrology and hydraulic analysis would include the installation of stream gauges in waterways within the easement area to gather stream flow data.
- Hydrology and hydraulic analysis includes water quality sampling to characterize baseline conditions of waterways. Water quality stations would be established and monitoring completed in three or four short excursions. A team of two field technicians would be at each water quality site for approximately 1 hour to collect a water sample and record field parameters. Access is via helicopter, which would land in an open area as close as safely practical and wait for the sample to be collected before moving to the next site. Total helicopter flying time for this activity would be approximately 10 hours per year.

2.2 CONSTRUCTION AND O&M ACTIVITIES - COMMON TO ALL ACTION OPTIONS (OPTIONS 2, 3, AND 4)

As described in Section 1.6, this RA considers the broad impacts of Construction and O&M of the road/rail and port. Until Planning Phase activities can occur within the easements to determine design parameters and until a mine plan exists, impacts of Construction and O&M cannot be estimated. Generally, however, the Construction Phase will include activities required to construct a road/rail and port area, including excavation, brush and tree clearing, blasting, and material and worker transportation. NPS assumes the O&M Phase will include activities that would result from the O&M of a road/rail and port area, including the use of the transportation corridor to haul mining materials and workers and use of the port to ship or receive mining materials and workers (Table 1-2). Additionally, the transportation corridor around the centerline of the road/rail would be up to 250 feet in width during Construction and up to 100 feet during O&M (Table 1-2).

Prior to Construction and O&M of the road/rail and port, more detailed and site-specific designs would inform future environmental reviews and permitting requirements.

2.3 EASEMENT AREA OPTIONS - TRANSPORTATION CORRIDOR AND PORT AREA

2.3.1 Option 1 – No Action

Under the No Action option, the easements for the port area and transportation corridor would not be conveyed. There would be no geotechnical assessment work, resource surveys, or

associated disturbance, and no port or road/rail line would be built. This option is described as a basis of comparison to provide robust analysis of impacts under the action options. If the No Action option is selected, NPS and CIRC may enter into a mutual agreement for the easements at some point in the future, consistent with the intent of ANCSA and the 1976 Act. A new analysis would be completed, as appropriate, in the future based on the proposal at that time.

2.3.2 Option 2 – CIRC's Initial Proposal

Option 2 (shown on Figure 2-1) would include the following three elements: the elements common to all action options (Section 2.1), conveyance of both the north and south transportation corridor easements for planning purposes, and the full port area (shown on Figure 1-1). The north and south transportation corridors combined are 10.8 miles long and up to 1,000 feet wide, and extend from the port area to the South Tract (approximately 1,277 acres). The port area in Option 2 is approximately 1,307 acres.

As described in Table 1-2, north or south transportation route and port area would be chosen before this phase begins, and the port area would be smaller than that originally proposed in the Planning Phase.

Option 2 considers CIRC's proposed Terms and Conditions in Section 2.5.1 as well as the General Easement Terms and Conditions in Appendix A.

On June 26, 2024, CIRC requested conveyance of the easements and provided preliminary easement maps as a part of that request. The Transportation Corridor and Port Area proposed by CIRC are what are used for this analysis for Option 2. NPS acknowledges that the easement area proposal by CIRC was a preliminary proposal and was not intended to be final.

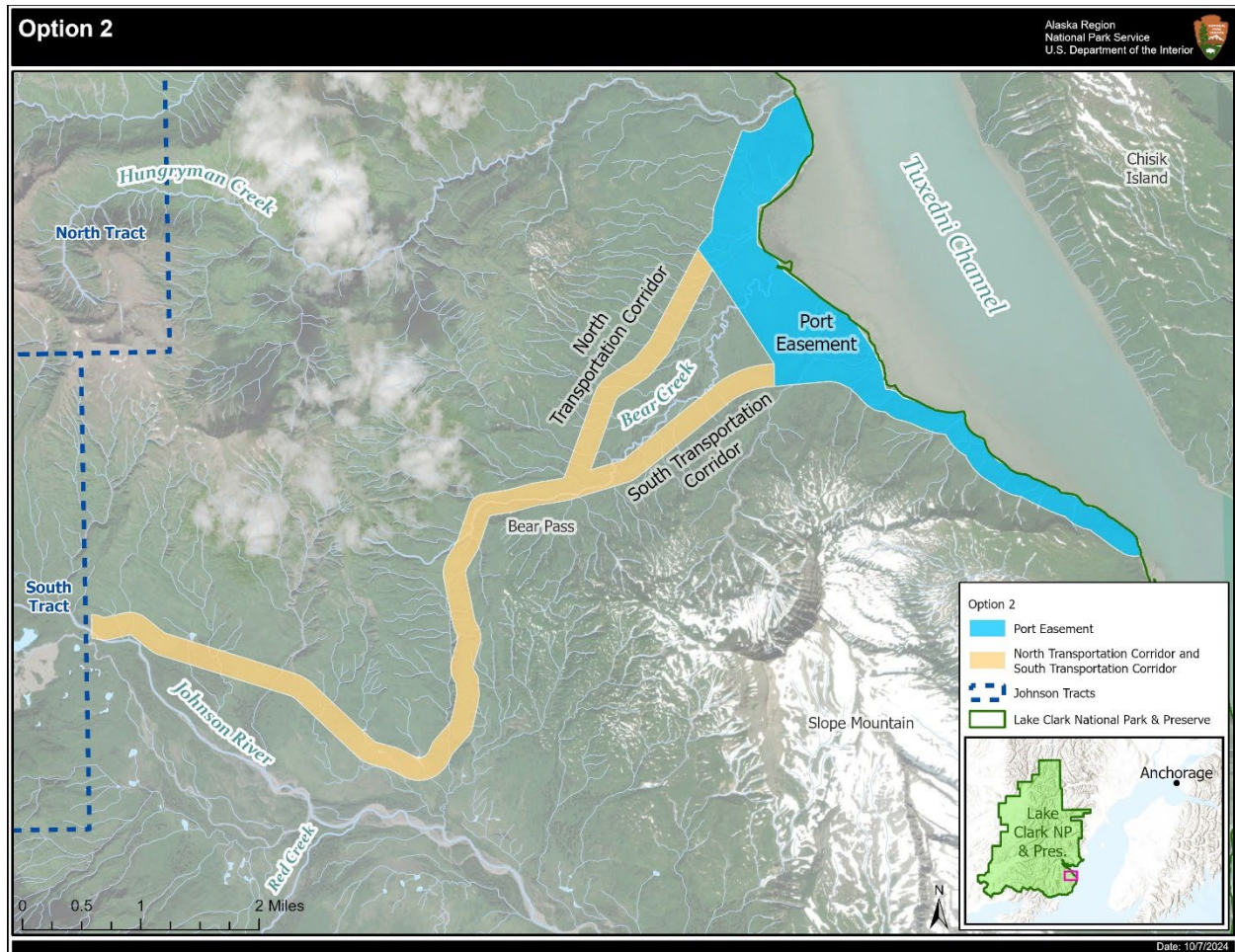


Figure 2-1. Option 2

2.3.3 Option 3 – North Transportation Corridor and Hungryman Creek (North) Port Area

Option 3 (Figure 2-2) includes the following three elements: the elements common to all action options (Section 2.1), conveyance of the north transportation corridor easement, and conveyance of the Hungryman Creek port area easement (shown on Figure 1-1). The north transportation corridor is approximately 8.6 miles long and up to 1,000 feet wide for Planning Phase activities (Table 1-2) and extends from the Hungryman Creek port area to the South Tract (approximately 1,050 acres). The Hungryman Creek port area is approximately 264 acres.

Option 3 considers NPS Terms and Conditions in Section 2.5.2 as well as the General Easement Terms and Conditions in Appendix A.

Because the 1976 Act requires that the locations of the transportation corridor and port area easements be “mutually agree[d]” to, the location for this option could only be implemented if CIRI were to agree to it. NPS has generated Option 3 with a North Transportation Corridor and Hungryman Creek Port Area for analysis purposes.

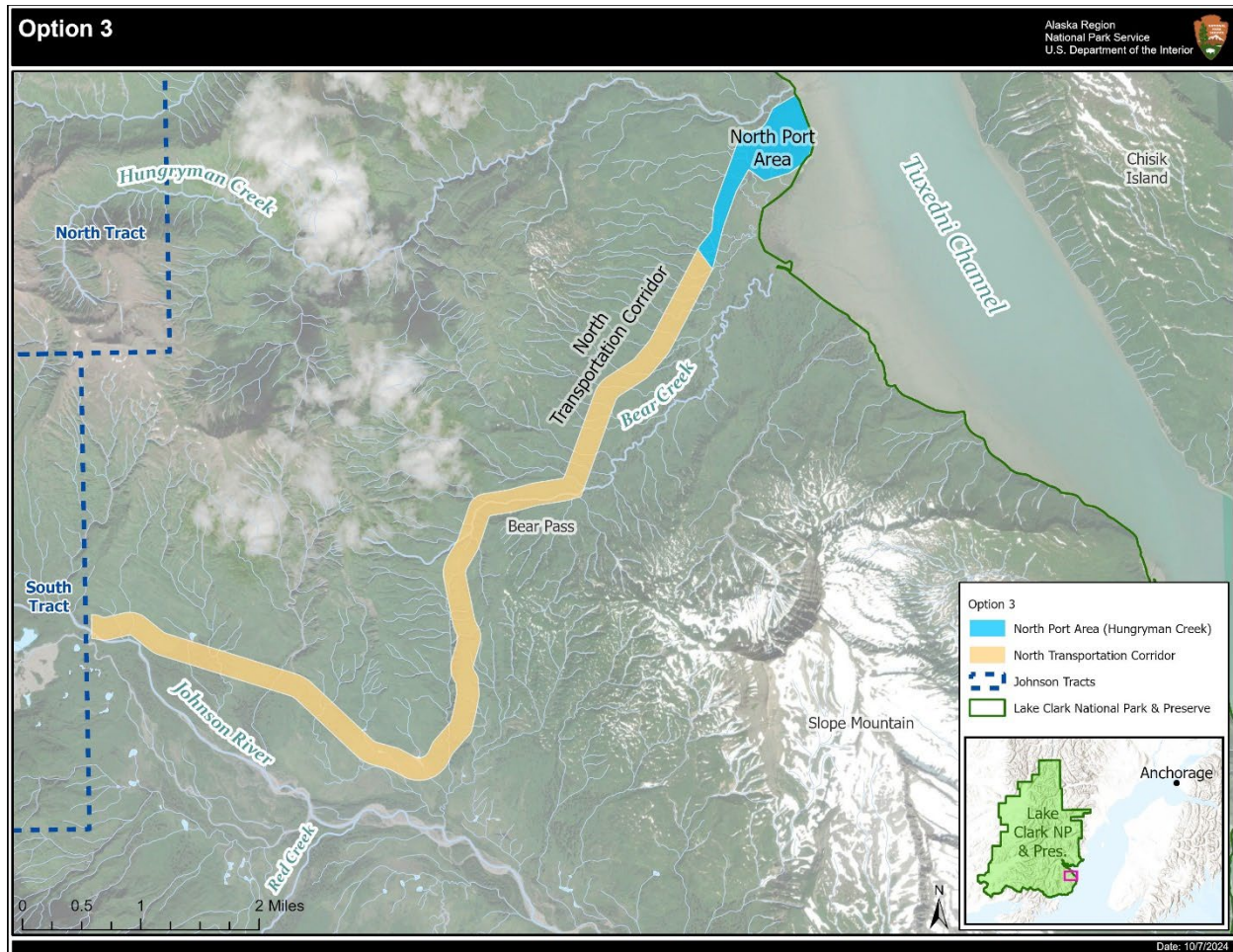


Figure 2-2. Option 3

2.3.4 Option 4 – South Transportation Corridor and Deep Water (South) Port Area

Option 4 (Figure 2-3) would include the following three elements: the elements common to all action options (Section 2.1), conveyance of the south transportation corridor easement, and conveyance of the Deep Water port area shown on Figure 1-1). The south transportation corridor is approximately 8.4 miles long and up to 1,000 feet wide for Planning Phase activities (Table 1-2) and extends from the Deep Water port area to the South Johnson Tract (approximately 1,016 acres). The Deep Water port area is approximately 549 acres.

Option 4 considers Terms and Conditions common to all action options in Appendix A and the NPS Terms and Conditions in Section 2.5.2 as well as the General Easement Terms and Conditions in Appendix A.

Because the 1976 Act requires that the locations of the transportation corridor and port area easements be “mutually agree[d]” to, the location for this option could only be implemented if CIRC were to agree to it. NPS has generated Option 4 with a South Transportation Corridor and Deep Water Port area for analysis purposes.

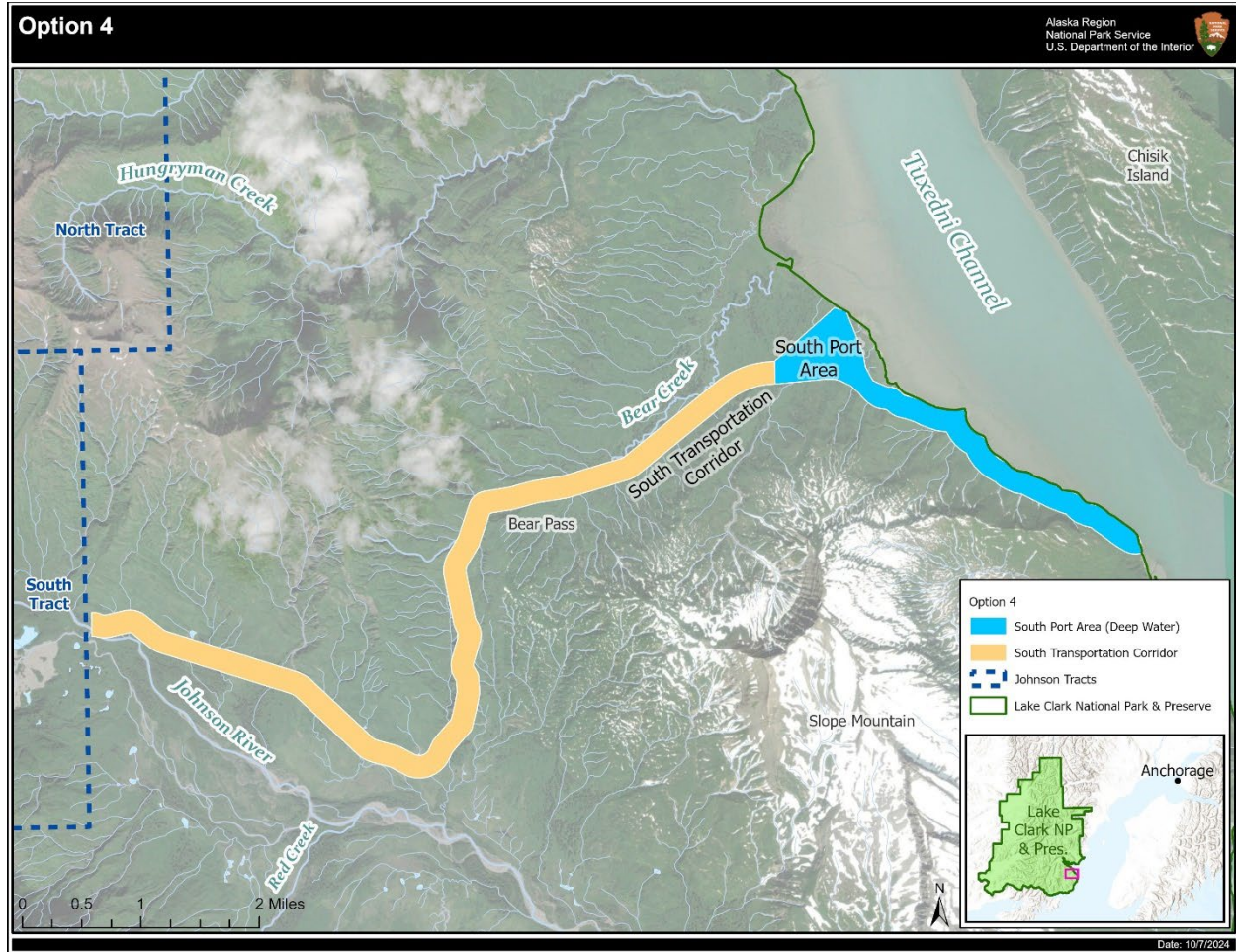


Figure 2-3. Option 4

2.4 OPTIONS CONSIDERED BUT DISMISSED

2.4.1 Johnson River Route

CIRI evaluated several transportation route and port area options and produced a series of studies between 1992 and 1995, as described below. As a part of that reconnaissance effort, a corridor traveling beside the Johnson River (Figure 2-4) was identified as a potential transportation route. This approximately 12-to-16-mile route would generally follow the Johnson River from its headwaters at the base of the Johnson Glacier and connect to a port area at Iliamna Point.

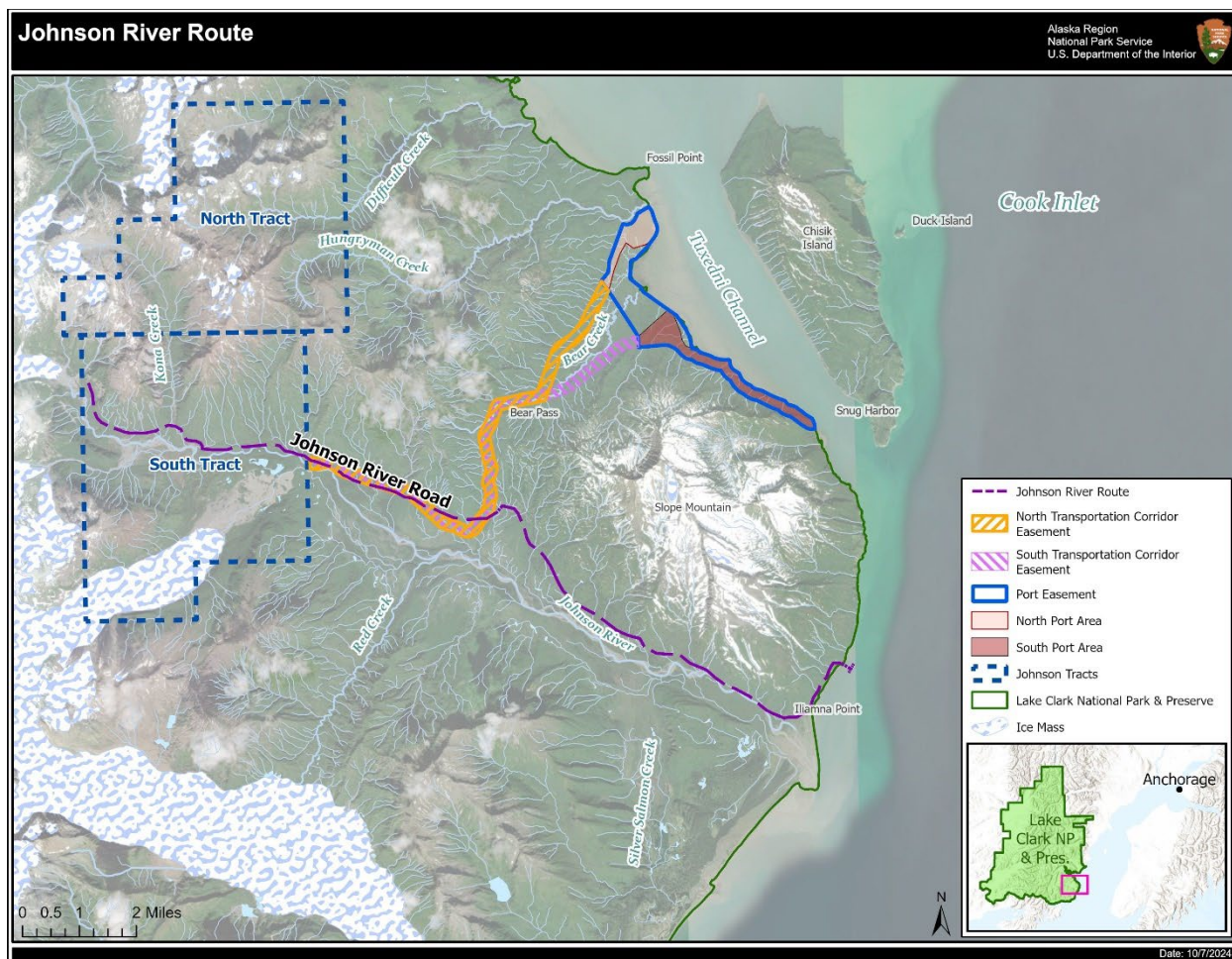


Figure 2-4. Johnson River Route

Iliamna Point is located south of the entrance to the Tuxedni Channel and is considered by CIRI to be an undesirable port location due to many factors, including the shallowness of the surrounding water and the exposure to severe wave action and ice from Cook Inlet (PND 1992). The distance to deep water from a port located at Iliamna Point is greater than 500 meters, which would make barge access difficult and expensive (Golder Associates 1995). Additionally, the only laydown area around the potential port area would be approximately a mile south (closer to the mouth of the Johnson River) due to the steep cliffs that surround Iliamna Point. Large boulders on the beach would also hinder movement to and from the port and would be an additional cost to move.

The Johnson River transportation route was deemed by CIRI to be less desirable than a route over Bear Pass due to the potentially higher impact on high-value wetlands, visual resources, wildlife, noise, land use, recreation, and commercial uses, and because of terrain challenges (CIRI 1993; CIRI 2024; RECON 2023). Though the Johnson River route would cross fewer wetlands than a route over Bear Pass, the wetlands for the Johnson River route were considered to be high-value coho salmon [*Oncorhynchus kisutch*] rearing and swan nesting habitat (CIRI 1993), and thus the impacts were expected to be greater.

NPS's information regarding possible impacts to resources is consistent with CIRI's. NPS's information demonstrates this route would likely bisect important habitat for fish and wildlife.

Anadromous and resident fish use the waters of the lower Johnson River and smaller tributaries that feed it. Both coho and chum salmon are found in this area, with waters supporting both adult and juvenile life stages of these fish. The Johnson River is one of the more important areas for moose on the coast of the Park. In winter, moose concentrate in the lower Johnson River valley when deep snow limits their movements, making this an area of great importance (NPS unpublished data, n.d.-a, -b). There are eight known bald eagle nests in the lower Johnson River Valley adjacent to this transportation route. The lower Johnson River has a relatively high number of eagle nests representing multiple territories (NPS unpublished data, n.d.-c). This is likely a result of the diverse food resources available throughout the nesting period. Additionally, due to the availability of chum and coho salmon in the river system starting in late summer and because the river freezes relatively late, this area supports large concentrations of post-breeding eagles (Bennett 1996). The extensive emergent freshwater wetlands of the river valley support a variety of waterfowl seasonally and currently support multiple active beaver lodges. Previous surveys documented the Johnson River delta as one of three major haulout areas for harbor seals in the Park, along with Upper Tuxedni Bay and Upper Chinitna Bay/Clearwater Creek (Bennett 1996; Boveng et al. 2011).

The lower Johnson River also supports high levels of use by brown and black bears. Use occurs throughout the river corridor but is concentrated near the river mouth and extending south toward Silver Salmon Creek, which provides high quality foraging areas in the spring and early summer prior to the arrival of salmon into the system. Between 2003 and 2023, 38 aerial bear surveys were conducted along the Park coastline with a focus on salt marsh systems. Approximately four times as many bears were observed using the Johnson River mouth and Silver Salmon Creek area than in the Bear Creek and Tuxedni Channel area (NPS unpublished data, n.d.-d). The high levels of bear use attract visitors seeking bear viewing opportunities to the adjacent Silver Salmon Creek area extending north to the Johnson River mouth. Guided bear viewing is the greatest activity use by coastal visitors, supporting some of the highest visitation levels in the Park (NPS 2021, 2024a). Visitation from 2009 to 2023 has increased almost 550 percent along the coast, with Silver Salmon Creek seeing the second greatest increase in visitation for coastal areas (NPS 2021, 2024a).

The terrain for this route would be especially challenging compared to a route over Bear Pass. A portion of the infrastructure for this route would need to be immediately adjacent to the Johnson River. Due to the elevation difference between the road/rail and port area, the approach to the port would need to be on steep terrain that is only traversable with a four-wheel drive vehicle or placement of a conveyor high above the terrain. Due to the terrain and location challenges, the estimated costs of constructing a road/rail along the Johnson River and a port area at Iliamna Point were estimated to be higher than routes over Bear Pass, which is an important consideration for CIRC.

As stated in Public Law 94-204, CIRC and the Secretary must “mutually agree” on locations for a transportation route and port area that “reasonably provide for receiving, shipping, storage, and incidental handling, and incidental facilities” of the minerals extracted from the Johnson Tract. CIRC has determined that the Johnson River route with a port at Iliamna Point is not viable (CIRC 2024). The much greater resource impacts also make this route undesirable to the NPS. At this time, it appears infeasible to reach mutual agreement on this location. Additionally, the much greater resource impacts make this route undesirable to NPS. Thus, this route option will not be analyzed in detail in this RA.

2.5 TERMS AND CONDITIONS

This RA analyzes two sets of preliminary Terms and Conditions for Planning Phase actions within the easements: Terms and Conditions proposed by NPS (see Section 2.3.1) and Terms and Conditions submitted by CIRC in their proposal for the easement conveyances (see Section 2.3.2). Terms and Conditions define and describe the scope of use for the easements. The Terms and Conditions applied to the easements will be phase-specific, allowing for the scope to change for each phase. The Planning Phase Terms and Conditions define the activities that are authorized in greater specificity and establish protective measures for NPS resources. The Terms and Conditions set forth in this RA are for analysis purposes and may change during agency consultations, public review, and discussions with CIRC. Final Terms and Conditions for Planning Phase activities will be incorporated into the deeds for the conveyed easements and disclosed in the decision document. Any activity that is not authorized by the easements would require either an amendment to the easements or written NPS approval, where such approval is allowed. Any Planning Phase activities or actions other than those contemplated in this analysis may require additional future environmental review.

General Easement Terms and Conditions exist within the main body of the deed. The General Easement Terms and Conditions would apply to all action options and all phases (Appendix A). There is not sufficient detail about Construction and O&M to develop specific Terms and Conditions for these phases. More specific Terms and Conditions for Construction and O&M will be determined once the actions are sufficiently developed to conduct a site-specific environmental review and identify permitting requirements.

2.5.1 CIRC Terms and Conditions for Planning Phase Activities

CIRC has submitted Terms and Conditions for the easement conveyances. The Terms and Conditions proposed by CIRC are listed below and are applicable to the Planning Phase of Option 2 only. These Terms and Conditions are for analysis purposes only and are expected to change during agency consultations, public review, and discussions with CIRC. Final Terms and Conditions will be incorporated into the conveyed easements.

2.5.1.1 Helicopter Use

- Helicopter landings on Park lands will be restricted to the easement areas.

2.5.1.2 Wildlife

- If a field crew encounters a freshly excavated bear den or a bear denning, work in the area may only continue if a minimum separation distance of 1 kilometer can be maintained. This distance will limit bear disturbance and minimize the chance for a negative human-bear encounter. Encounters will be reported to the Park.
- During active migratory bird nesting seasons, CIRC will perform a visual inspection for active nests of state and federally listed birds before establishing new drill sites. Activities at drill sites will be postponed or relocated if such an active nest is identified within 100 feet of the drill site.

2.5.1.3 Vegetation and Nonnative Invasive Species

- To prevent the spread of invasive species into the Park, clothing, gear, building materials, and all equipment will be cleaned and be free of soil or plant material before entering the Park.

- Site visits will be required to geotechnical assessment (specifically, borehole) drilling sites 2–3 years after reclamation to determine if any invasive species have become established.
- If invasive species are found in the easement area, NPS will be consulted for appropriate measures to remove them.
- Invasive species–related issues and mitigations will be presented within the annual report to NPS.

2.5.1.4 Water Quality, Fish, Wetlands, Floodplains, and Aquatic Resources

- Drilling materials will not be discharged directly into any standing or flowing water or vegetated areas.
- Any gross introduction of sediment/turbidity to a water source will be reported to NPS and the Alaska Department of Environmental Conservation immediately.

2.5.1.5 Reclamation

- Boreholes and test pits that do not collapse in upon themselves will be backfilled.
- In reclamation, no excavated ground will be left with a slope >15 percent greater than the surrounding slopes, and soil will be covered by rocks of the same average size as the surrounding rocks, or if initially vegetated, native vegetation.
- Drill site and cleared helicopter landing zone location coordinates will be provided to the NPS annually.

2.5.2 NPS Terms and Conditions for Planning Phase Activities

The anticipated NPS Terms and Conditions for the Project are listed below and are applicable to the Planning Phase of Options 2 and 3. NPS has prepared proposed Terms and Conditions for the easements that are intended to protect Park resources while still fulfilling the conditions of ANCSA and the 1976 Act. These Terms and Conditions are for analysis purposes only and are expected to change during agency consultations, public review, and discussions with CIRI. Final Terms and Conditions will be incorporated into the conveyed easements.

2.5.2.1 General Terms and Conditions

1. Activities are restricted to only those resulting in limited or short-term ground disturbance. Short-term means lasting 5 years or less and ground disturbance means any activity that compacts or disturbs the ground, such as the installation of helicopter landing sites or drill pads.
2. All ground-disturbing activities occurring during the Planning Phase must not cumulatively exceed 1.5 acres for the transportation corridor and 1 acre for the port area easement.
3. Planning Phase activities may only occur between June 1 and September 30.
4. No more than 150 exploratory geotechnical boreholes/test pits in the transportation corridor and 100 exploratory geotechnical boreholes/test pits in the port area easement shall be drilled during the Planning Phase.
5. Drill pads may be no more than 20 by 20 feet.

6. No more than 70 hours of helicopter flight time per operating season is allowed for work within the transportation easement area. No more than 20 hours of helicopter flight time per operating season is allowed for work within the port area easement.

The above Terms and Conditions numbered 1–6 are as stated unless prior written approval is provided by NPS.

2.5.2.2 Paleontological Resources

- NPS will conduct a pre-ground disturbance paleontological survey, anticipated for spring 2025. NPS will provide CIRI findings of the report with recommendations for consideration in future planning for this Project. CIRI may need to provide a paleontological monitor for ground disturbing activities.

2.5.2.3 Cultural Resources

- Prior to beginning ground disturbing work within the easement area, an Archaeological Resources Protection Act (ARPA) permit must be procured from the NPS.
Aircraft/Helicopter Use
- Helicopter landings on Park lands will be restricted to the easement areas.
- Wherever possible, helicopter landing sites will be selected in open areas where brushing is either not required or where brushing is minimized.
- No more than 20 helicopter landing sites may be created. Each helicopter landing site must be no greater than 14 by 14 feet (196 square feet) unless prior written approval is provided by NPS.
- No helicopter landing sites may be created within wetlands or standing water.
- At the end of each field season, a report of landing sites will be provided to NPS documenting the number of landing sites created, maintained, or reclaimed with a map of all landing sites within the easement area.

2.5.2.4 Wildlife

- CIRI will obtain any necessary permits under the Marine Mammal Protection Act.
- If activities produce underwater pressure levels exceeding 120 decibels, a protected species observer will be required in accordance with National Marine Fisheries Service (NMFS) recommendations.
- Vessels may not be operated in such a way as to separate members of a group of marine mammals.
- Helicopters may not hover or circle above marine mammals.
- Aircraft are required to operate at least 1,500 feet (457 meters) above sea level when within 500 lateral yards (457 meters) of marine mammals, except for emergency or navigational safety.
- Drilling activities will not be permitted from September 1 to May 15 when Cook Inlet beluga whales are present in nearby critical habitat (Castellote et al. 2024).

Bears

- If a field crew encounters a freshly excavated bear den or a bear denning, work in the area may only continue if a minimum separation distance of 1 kilometer can be maintained. This distance will limit bear disturbance and minimize the chance for a negative human-bear encounter. All encounters will be reported to NPS.
- If a bear is observed from a flight, at least 1 kilometer of distance will be maintained to minimize disturbance. When this distance cannot be maintained, an alternative flight path will be adopted.
- Food and beverages, food and beverage containers, garbage, harvested fish, and all other scented items must be stored in a bear resistant container approved by NPS, secured within a hard sided aircraft with the doors closed, and secured when left unattended. Bear resistant containers include items approved by the Department of Interagency Grizzly Bear Committee as well as items listed by the State of Alaska, Department of Fish and Game, and Division of Wildlife Conservation. Lists of these options may be found at the following sources:
 - <http://igbconline.org/certified-products-list/>
 - <http://www.adfg.alaska.gov/index.cfm?adfg=livingwithbears.bearcontainers>
- If camping within one-half mile of the coastline of Cook Inlet, CIRI shall adhere to food storage methods found in the Superintendent's Compendium.

Sea Otters

- Vessel operators should conduct activities at the maximum distance possible from groups of sea otters at all times. At a minimum, vessels should avoid approaching within 91 meters of sea otters.
- Vessel operators should avoid multiple changes in direction when within 274 meters of groups of sea otters; however, those vessels capable of steering around such groups should do so.
- Vessels in transit shall be operated at speeds necessary to ensure no physical contact with sea otters occurs. Vessels should avoid multiple speed changes; however, vessels should reduce speed to 10 knots or less when within 274 meters of groups of sea otters, especially during poor visibility, to reduce the potential for collisions.

Bald Eagles/Migratory Birds

- Planning Phase activities may not occur within a 660-foot buffer around known bald eagle nests. At the beginning of each season, NPS will provide a map of known nest sites to CIRI.
- Helicopters and fixed-wing aircraft should avoid operating aircraft within 1,000 feet of any eagle nest during the breeding season, April 1 through October 15.
- Vegetation removal, including brushing, will only occur outside of the designated migratory bird nesting season, April 15 to July 15. CIRI must use a biologist with knowledge and practical experience in identifying birds found in this region of Alaska by sight and sound and in bird behaviors indicative of nesting and brood rearing to determine if any nesting birds occur in or near the Project area prior to vegetation

removal. If it is determined that no nesting birds occur in or near the Project area, work may commence during the designated nesting season.

- Aircraft shall avoid approaching within 1 kilometer of any seabird colony April 15 through August 31 where safety allows. To minimize disturbance to birds, aircraft shall avoid approaching within 1.8 kilometers of all seabird colonies and aircrafts will maintain an altitude of at least 610 meters when flying over seabird colonies.
- To minimize impacts to nesting seabirds, vessels travelling greater than 5 knots shall not approach within 1.8 kilometers of all seabird colonies.

2.5.2.5 Vegetation and Invasive Species

- To prevent the spread of invasive species into the Park, clothing, gear, building materials, and all equipment will be cleaned via pressure washer, equipment weed wash, or something similarly robust, and be free of soil or plant material before entering the Park. Annual invasive species mitigation practices will be included in annual reporting.
- CIRI will visit geotechnical (specifically, borehole) drilling sites 2–3 years after reclamation to determine if any invasive species have become established. This information will be included in the annual reporting to NPS.
- If invasive species are found in the easement area, CIRI will consult with NPS and implement NPS-directed measures to remove them and implement any NPS-directed follow-up invasive monitoring on the site. Any invasive species locations and removal will be presented within annual reporting to NPS.
- CIRI will avoid any ground or vegetation disturbing activity at or near any rare plant species listed by the Alaska Center for Conservation Science, the state sanctioned authority on the listing and tracking of rare plants in Alaska.
- Any ground disturbance resulting in removal of vegetation will require restoration of the vegetation. If revegetation requires sourcing plants or seeds from outside of the immediate Project area, written approval from NPS is required prior to application.
- No trees will be cut during brushing. For this purpose, a “tree” is defined as anything with a diameter larger than 6 inches diameter at breast height and height greater than 15 feet. To further prevent young trees from being cut down, brushing activities will be restricted to shrub or open ecotypes as defined by Wells et. al. (2013). If greater than 6 inches diameter at breast height, superintendent approval is required.

2.5.2.6 Water Quality, Fish, Wetlands, Floodplains, and Aquatic Resources

- Drilling materials will not be discharged directly into any standing or flowing water or vegetated areas.
- Any gross introduction of sediment/turbidity to a water source will be reported to NPS and the Alaska Department of Environmental Conservation immediately.
- Every effort will be made to minimize adverse impacts to wetlands and floodplains, including disruption of natural surface and groundwater flow, soil compaction, extensive soil disturbance that could result in erosion, and the disturbance of plant root systems. These include the use of mats or other commonly used material when crossing or working in saturated soils and wetland areas.

- Special precautions should be taken to promptly stabilize areas of disturbed soil located near wetlands, streams, and floodplains. Matted areas within wetlands shall be restored to their original condition and elevation. This may involve natural revegetation from existing root and seed stock of native plant species. Conditions may warrant planting and the broadcast of a wetland seed mix over the matted area to supplement the existing seed and rootstock.
- A spill prevention and response plan must be submitted to NPS no later than June 1 each year.
- If drilling fluids and other waste materials are generated during technical engineering exploration, waste material is not permitted to be released into the environment. Any material spills, including fuel spills, must be immediately reported to the Park in addition to any requirements contained in the operator's spill prevention and response plan.
- No drilling or installation of boreholes and test pits may occur within wetlands or standing water.
- Fish habitat permits will be obtained from the Alaska Department of Fish and Game (ADFG) Habitat Section regarding Title 16 permit requirements for work in fish-bearing waters.
- Trampling and crushing of redds (salmon egg nests) will be avoided to the maximum extent practicable.
- Drill pads, helipads, and sumps should be kept at least 50 feet from flowing water.

2.5.2.7 Geotechnical Operations

- If required, sumps will be appropriately sized, unlined, and used to capture drill cuttings and fluids.
- Drilling fluids will consist primarily of water. If drilling additives are necessary, standard potential drilling fluid additives will be provided for evaluation and approval. Sumps will be dug deeply enough to capture all drill fluids, a clay cap will be placed on drill sumps, and the clay cap will be covered with native soil and native vegetation.
- CIRI will cease exploration activities when the ground is no longer able to absorb discharge due to being frozen or saturated.
- Silt fences will be placed downgradient of sumps to prevent accidental overflows from spreading into the environment.
- Drillholes will be maintained or managed following Best Management Practices.
- CIRI will prepare a drill plan that provides measures for sealing any anticipated artesian wells.
- Drill cuttings and fluids will not be discharged directly into any standing or flowing water or vegetated areas. Drilling fluids will be kept in containment to prevent escape to environment.
- CIRI will conduct daily inspections of the drill sites, water sources, and sumps to identify potential issues. Issues will be reported to NPS immediately. Issues will be reported, repaired, and or recommended repairing options provided to the NPS.

- Any introduction of sediment/turbidity to a water source will be reported to NPS and the Alaska Department of Environmental Conservation immediately.
- All equipment requiring fuel and fuel storage will be stationed within secondary containment to control any fuel spills.
- Lubricating grease used for drilling will be stored in secondary containment.
- A one-eighth-inch stainless steel screen will cover the intake hose to prevent organisms from being pulled into the pump. The intake will be placed in a 5-gallon bucket to further mitigate this risk.
- In situations when stream levels are extremely low and field crews have trouble maintaining sufficient intake flows, work will be suspended until flows increase to minimize potential dewatering impacts to fish downstream. Alternatively, another water source could be used if sufficient flows are present.
- Sumps and bare ground will be reclaimed using stockpiled overburden and topsoil from the site.

2.5.2.8 Reclamation

- Boreholes and test pits that do not collapse in upon themselves will be backfilled.
- In reclamation, no excavated ground will be left with a slope >15 percent greater than the surrounding slopes, and soil will be covered by rocks of the same average size as the surrounding rocks or, if initially vegetated, native vegetation.
- Drill site and cleared helicopter landing zone location coordinates will be provided to NPS annually.

3 AFFECTED ENVIRONMENT AND ENVIRONMENTAL CONSEQUENCES

3.1 INTRODUCTION

The analysis contained in this section is organized by resource topic and describes impacts that could result from selection of Options 1, 2, 3, and 4.

The “Current and Expected Future Conditions of the Environment” section is presented first and includes a discussion of trends and planned actions, where appropriate, that affect each resource topic. Note that for all resource topics, the impacts of Option 1, the No Action option, are captured in the “Current and Expected Future Conditions of the Environment” section, because selection of the No Action would result in the same impacts and trends as are currently occurring.

The “Environmental Consequences” section evaluates direct, indirect, and cumulative effects from the implementation of each option. A factual description of the direct and indirect effects provides the reader with an understanding of how the current and expected future condition of the resource would likely change as a result of implementing each option. The “Additional Impacts from Planned Actions” section describes the cumulative effects of each option, which are effects that result from the incremental impact of the option when added to other past, present, and reasonably foreseeable planned actions.

A comparative conclusion of the options is included at the end of each resource topic.

3.2 RESOURCES

3.2.1 Resources Selected for Detailed Analysis

The following resources were identified for detailed analysis in this RA:

- Aquatic Resources
- Wildlife
- Cultural Resources
- Special Status Species
- Water Quality and Surface Water Hydrology
- Soundscapes
- Wetlands
- Vegetation
- Paleontology
- Visitor Use and Experience
- Subsistence
- Health and Human Safety
- Environmental Justice
- Socioeconomics
- Wilderness

3.2.2 Resources to Potentially Consider in Future Phases

The following resources were identified and considered and, while not included in this RA for detailed analysis due to negligible or no impact for Planning Phase actions, may be considered during Construction and/or O&M for the reasons listed:

- Viewshed: NPS is unable to perform a viewshed analysis without designs for Construction and information for O&M. Prior to Construction, a viewshed analysis, particularly for the

impacts of the possible port area to Snug Harbor Packing Company historic district (listed under the National Register of Historic Places [NRHP]) may be required once the locations and design of Project components are available. Visual impacts from the Project to the setting and feeling of the Snug Harbor Packing Company historic district could be estimated and, if appropriate, mitigation measures developed to minimize impacts.

- **Floodplains:** Because the specific road/rail alignment and port area location is not known, NPS is unable to calculate how many acres of floodplains may be affected. There are no Federal Emergency Management Agency flood maps available for the Project area. Projects on NPS lands must meet the requirements of Directors Order 77 and the associated Procedural Manual to minimize impacts on floodplain functions and to prevent the effects of flooding on infrastructure.
- **Air Quality:** NPS estimated air quality impacts from geotechnical borings. Using an estimated 48 drill holes (120 field days per year, 2 drill rigs in operation, and completed every 5 days) to be completed per year resulting in approximately 384 hours of drilling time per year (48 drill holes requiring 8 hours of active drilling). The results demonstrate, that based on NPS assumptions, emissions are negligible under any scenario for Planning Phase—less than 1 ton/year for all criteria pollutants and less than 100 tons/year for CO₂ emissions from geotechnical drilling during the Planning Phase. The wilderness portion of nearby Chisik and Duck Islands are considered a “Class I” area under the federal Clean Air Act (Figure 1-1). Tuxedni Wilderness contains 5,556 acres that are managed by the U.S. Fish and Wildlife Service’s (USFWS’s) Alaska Maritime National Wildlife Refuge. The Clean Air Act gives special air quality and visibility protection to national wilderness areas larger than 5,000 acres and National Parks larger than 6,000 acres that were in existence in 1977 when the Act was amended. Tuxedni Wilderness was established in 1970 and is granted these special air quality protections (42 U.S.C. § 7472). Prior to Construction or O&M activities, a plan of operations along with identification of air pollutant emitting activities will assist in determining analysis needs for both Tuxedni Wilderness and Lake Clark National Park and identify whether the Project may require an air quality permit from the Alaska Department of Environmental Conservation.
- **Soils:** The major soil landscape (which is an aggregation of similar ecotypes with similar soils) for the proposed transportation and port area easements is generically mapped as “Maritime Upland Rock Barrens, Shrublands, and Forests,” and more specifically is Typic Cryandepts (IAII), which exist in the high elevations of Bear Pass and are prominent in the lower elevations on either side of the pass (CIRI 2024). Because the specific road/rail alignment and port area location is not known, NPS is unable to determine how and what kind of soils will be affected. The port area and transportation corridor would need to be refined before impacts to soils can be identified.
- **Marine/Estuarine:** Project Construction and O&M could impact marine and estuarine resources. Marine/estuarine resources that have potential for impacts during Planning Phase are analyzed below under Aquatic Resources, Wildlife, Special Status Species, and Wetlands. Additional impacts could occur to other marine/estuarine resources during Construction and O&M. NPS would need to know details about construction methods, port area location, design, and operation plans in order to analyze impacts to additional marine/estuarine resources beyond those analyzed here.
- **Geologic Features/Processes:** The Project area is underlain by a sequence of Jurassic-aged volcanic and sedimentary rocks and overlain by a relatively thin mantle of glacially derived

sediments, fluvial reworked deposits, and recent volcanic ash from nearby volcanos (Augustine, Iliamna, and Redoubt). Construction of a road/rail line would permanently alter existing rock formations and modify the topography of slopes surrounding the roadbed/rail site. However, NPS would need to know details about road/rail siting, construction methods, port location, design, and operation plans in order to analyze impacts to geologic features/processes. Designs will need to consider potential for the transportation route to impact geologic processes resulting in landslides to ensure that impacts to Park resources are avoided or minimized. While details about the design and engineering are not known, the transportation route would traverse weak marine sedimentary rocks which are prone to landslides. The weak marine sedimentary rocks are found at bear pass and along the shores of the south corridor (Figure 1-1).

- **Hazardous Materials:** Project Construction and O&M have the potential to release hazardous materials into the environment, including the waterways of the Project area and Cook Inlet. Cook Inlet has been and continues to be affected by releases of hazardous materials from offshore oil and gas development, waste discharge, oil spills, contaminated runoff, spills of contaminants other than oil, watercraft exhaust and effluent, coal transportation and burning, trash, and others. Construction equipment, human activity, transportation of mining materials, loading of mining materials onto a barge, and other activities related to Construction and O&M could all cause releases of hazardous materials into the environment. However, without construction plans, including the types and number of heavy equipment used, road/rail and port design, and a mining operations plan, it is not possible for NPS to analyze hazardous materials impacts in this RA.
- **Night Sky:** One measurement of night sky brightness has been completed in the Park area (Dark Sky Partners 2019). Observers confirmed “there are no visible lights (or [light] domes) anywhere along the horizon that can be seen with the naked eye,” which is corroborated by minimal upward radiation along the Park’s Cook Inlet coast as revealed on the National Polar-Orbiting Partnership Suomi satellite. At this time, NPS does not know what kind of lighting will be utilized for Construction and O&M activities.
- **Greenhouse Gas Emissions/Climate Change:** Project Construction and O&M have the potential to release emissions into the environment of the Project area and Cook Inlet. Cook Inlet has been and continues to be affected by releases of greenhouse gas emissions that contribute to climate change from offshore oil and gas development, watercraft exhaust, coal transportation and burning, trash, and other sources of emissions. Construction equipment, human activity, transportation of mining materials, loading of mining materials onto a barge, and other activities related to Construction and O&M could all cause releases of greenhouse gas emissions into the environment. However, without construction plans, including the types and number of heavy equipment used, road/rail and port design, and a mining operations plan, it is not possible for NPS to analyze greenhouse gas emissions and the contribution to climate change from these activities in this RA.

3.3 AQUATIC RESOURCES

3.3.1 Current and Expected Future Conditions of the Environment

3.3.1.1 Fish

Several studies have been conducted that document freshwater fish resources in the area of the proposed easements, and fish have been documented within both the Johnson River and Bear Creek drainages. However, on both sides of the upper Johnson River, the availability of fish habitat is limited by steep valley walls, although habitats on the southern side of the river in this area are more complex and may provide more slough, back-channel, beaver pond, and groundwater fed habitats that could support fish (ADFG 2022). Aquatic resource habitats (like smaller streams/tributaries) on the north side of Johnson River are primarily high gradient streams and provide more limited fish habitat compared to downstream reaches (ADFG 2022). The lower stream reaches around the river's floodplain provide diverse and abundant fish habitat where gradients are lower and more off-channel habitat is available. Similar aquatic resource habitats are present in the Bear Creek drainage with its upper reaches limited by steep terrain in the vicinity of Bear Pass. Within the proposed port area easement, the Bear Creek drainage also contains numerous smaller, low-gradient streams and waterways that discharge into Tuxedni Channel, some receiving tidal influence, and flounder species were observed in some of these streams during 2023 sampling in the area by ADFG (ADFG 2022). It is expected that other marine resources would utilize this habitat.

In 2022 and 2023, ADFG conducted fish sampling in the Johnson River and Bear Creek drainages to better describe fish distribution in the area (ADFG 2022, 2023, 2024a), which extended the range of several species previously identified in the Anadromous Waters Catalog (AWC) (updated in 2023 for the Project area) (ADFG 2024a; Figure 3-1). NPS also conducted fish sampling throughout the Johnson River and Bear Creek drainages in 2022 and 2023 (ADFG Aquatic Resource Permit Numbers SF2022-165 and SF2023-206). During these surveys by ADFG and NPS, anadromous fish (Dolly Varden [*Salvelinus malma*], coho salmon, chum salmon [*Oncorhynchus keta*], and/or pink salmon [*Oncorhynchus gorbuscha*]) were documented in the Johnson River and Bear Creek drainages. Chum and pink salmon were generally documented in the lower reaches of these drainages, while coho were observed above the confluence with Red Creek, and Dolly Varden were well distributed throughout (including near the outfalls of Johnson and Double Glaciers in the Johnson River drainage, and extending to the upper reaches of Bear Creek near Bear Pass). Other fish species observed included ninespine (*Pungitius pungitius*) and threespine stickleback (*Gasterosteus aculeatus*), and sculpin species (*Cottus* spp.). Flounder species were also observed within the Bear Creek drainage in smaller streams near their point of discharge into Tuxedni Bay. Areas where NPS observed fish spawning are shown on Figure 3-1.

According to fish distribution data provided by the AWC, several streams in the area of the proposed easements support anadromous fish, including Bear Creek (AWC Stream Code 245-30-10130), Johnson River (AWC Stream Code 245-20-10170), and their associated tributaries (Figure 3-1). Within the Bear Creek drainage, two additional small streams are mapped in close proximity to Tuxedni Bay, including Little Bear Creek (AWC Stream Code 245-30-10133) and an unnamed smaller tributary further to the east (AWC Stream Code 245-30-10135). Coho salmon are listed as rearing or present within the two smaller tributaries and present within Bear Creek itself. Chum and pink salmon are also listed as present within Bear Creek (ADFG 2024b). A small portion of the port area easement is also in the vicinity of Hungryman Creek (AWC

Stream Code 245-30-10120), which is mapped with pink salmon, chum salmon, and anadromous Dolly Varden present (ADFG 2024b).

While numerous streams within the Johnson River drainage are included in the AWC, only a few overlap the easement areas. These include two unnamed tributaries, including AWC Stream Codes 245-20-10170-2020-3001 and 245-20-10170-2020. These smaller tributaries generally drain south from Bear Pass before discharging into the Johnson River. Coho salmon are either listed as present (AWC Stream Code 245-20-10170-2020) or rearing (AWC Stream Code 245-20-10170-2020-3001) in these smaller tributaries. Within the Johnson River (and within the proposed easement areas), coho salmon are listed as present and/or rearing in the Upper Johnson River watershed, and anadromous Dolly Varden are also listed as present within the Johnson River (ADFG 2024b).

Anadromous waters mapped by ADFG (2024b) in the area are shown below in Table 3-1 and on Figure 3-1.

Table 3-1. Anadromous Waters Mapped in the Area of Proposed Easements

Drainage	AWC Stream Code	Species
Bear Creek	245-30-10130 (Bear Creek)	Coho salmon, chum salmon, pink salmon
Bear Creek	245-30-10133 (Little Bear Creek)	Coho salmon
Bear Creek	245-30-10135	Coho salmon
Hungryman Creek	245-30-10120 (Hungryman Creek)	Chum salmon, pink salmon, Dolly Varden
Johnson River	245-20-10170 (Johnson River)	Coho salmon, chum salmon, pink salmon, Dolly Varden
Johnson River	245-20-10170-2020	Coho salmon
Johnson River	245-20-10170-2020-3001	Coho salmon

Key: AWC = Anadromous Waters Catalog
Source: ADFG 2024c

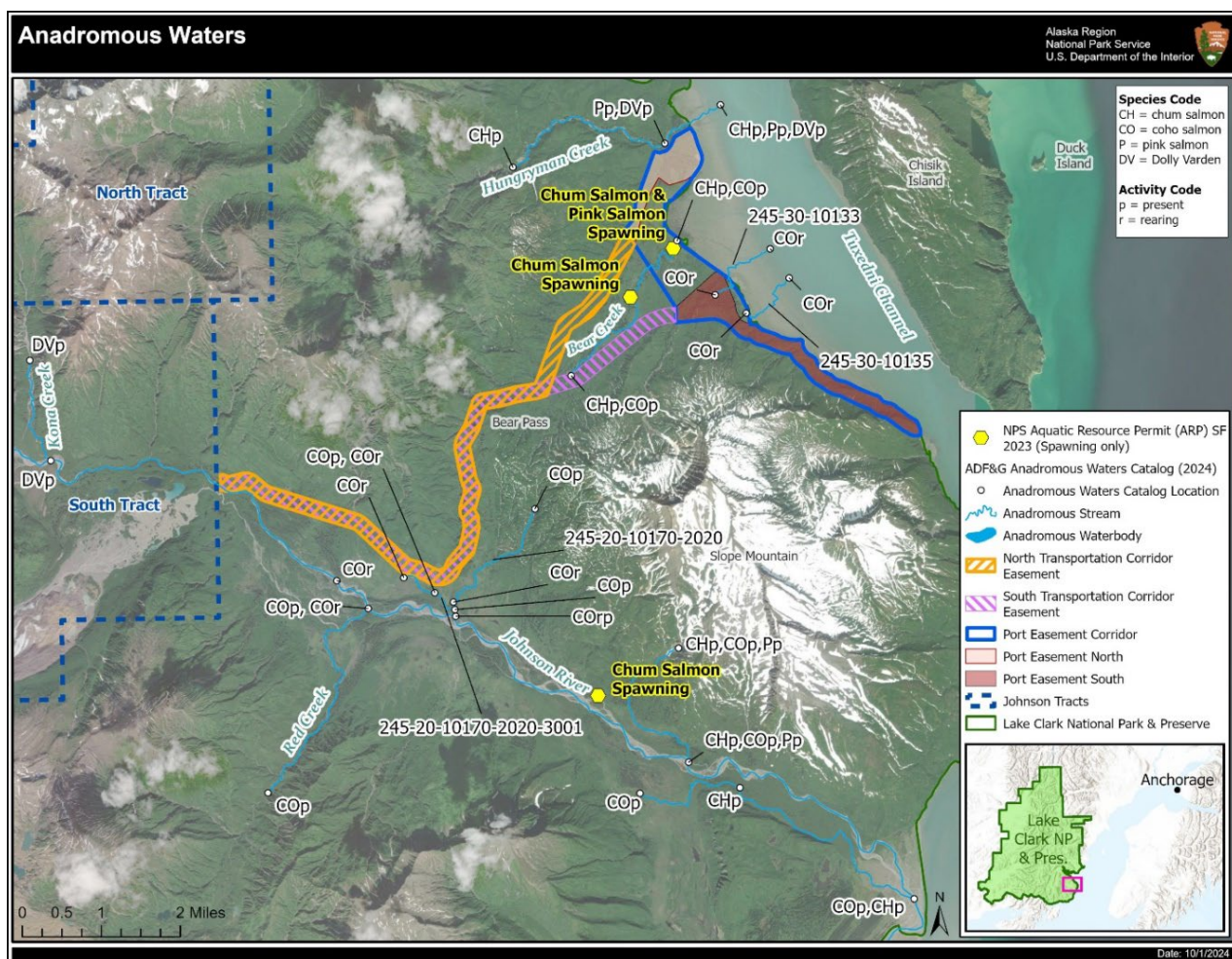


Figure 3-1. Anadromous Waters in the Project Area

3.3.1.2 Aquatic Invertebrates

Aquatic invertebrates are present in nearly all waterbodies and can function as important sources of food for a variety of animals, including freshwater fish (ADFG 2024c). In 2023, ADFG conducted aquatic invertebrate sampling at two locations within the Johnson River drainage: one high in Kona Creek and another in the upper reaches of the Johnson River itself. Twenty-four unique taxa were observed in Kona Creek, and 10 unique taxa were observed in the Johnson River. Chironomid invertebrates (midges) were the dominant taxa at both sampling locations (ADFG 2024c).

Aquatic invertebrate sampling was conducted in 1996 and 1997 within the Johnson River drainage and two sites within Bear Creek by NPS. Both sites within Bear Creek supported relatively high densities of invertebrates in August of 1996, largely dominated by chironomid species (although five invertebrate taxa were documented). However, densities of invertebrates were substantially lower in August of 1997, despite the invertebrate community composition being relatively similar between the two sample years (Milner 1998). These studies represent the most recent aquatic invertebrate data set.

3.3.1.3 Additional Trends and Planned Actions

The Cook Inlet Planning Area Oil and Gas Lease Sale 258 occurred on December 30, 2022; however, a July 2024 judicial ruling suspended the lease sale (U.S. District Court of Alaska Case No. 3:22-cv-00279-SLG). It is unclear if the lease sale will be permitted at this time. Should the lease sale move forward, there is potential for oil and gas exploration and development in Cook Inlet. Most aquatic resources within the easement areas would likely not be impacted by offshore oil and gas exploration. However, anadromous fish species may be impacted by changes in water quality in Cook Inlet that may result from oil and gas exploration, potentially impacting fish that would return to streams within the easement areas.

A changing climate has increased temperatures across Alaska in recent years, although long-term trends remain unclear (Ballinger et al. 2023). For the Park, this has resulted in increased temperatures along its coastline, while precipitation has remained fairly constant. As described in Section 3.9.1.1, an increase in temperature without significant increase in precipitation may dry wetlands or alter the hydrology of the area. Removal of wetlands or alteration of the hydrology of the area could decrease quality or quantity of aquatic habitats. Additionally, warming water temperatures are known to impact the viability of a waterway for salmonid species (Mantua et al. 2010). There are no additional trends or planned actions that would impact aquatic resources in the Project area. There are no plans for other management changes in the proximity of the Project that would impact aquatic resources. The Park and the surrounding areas would continue to be managed in ways similar to current conditions.

3.3.2 Environmental Consequences

3.3.2.1 Option 1 – No Action

Impacts of Option 1

Under Option 1, the easements would not be conveyed for either a port or a transportation route and the conditions of ANCSA and the 1976 Act would not be fulfilled. As a result, impacts to fish and aquatic invertebrates would be the same as described above in “Current and Expected Future Conditions of the Environment.”

Additional Impacts from Planned Actions

Under Option 1, an easement would not be conveyed and there would be no impacts to fish or aquatic invertebrates; therefore, the environment would remain the same as or similar to the “Current and Expected Future Conditions of the Environment” section. Past, present, and reasonably foreseeable actions and their impacts would be the same as those described in the “Current and Expected Future Conditions of the Environment” section.

3.3.2.2 Option 2 – CIRI’s Initial Proposal

Phase 1 – Planning Phase Activities

The Option 2 transportation corridor contains approximately 16 acres of perennial rivers and streams, consisting of portions of Bear Creek and the Johnson River and one smaller tributary (AWC Stream Codes 245-20-10170-2020-3001; Figure 3-1). Additionally, approximately 104 acres of wetland and waters habitat (see Section 3.9.2.2, Table 3-5) would also be subject to the easement conveyed. While some of these wetland habitats are isolated and not hydrologically connected to other waters, wetland habitats adjacent to perennial streams and rivers can provide important off-channel habitat for various fish species, particularly juvenile salmonids (Roni et al. 2016). The full port easement area would convey an easement area

covering approximately 19 acres of perennial waterbodies (see Section 3.9.2.2, Table 3-6) consisting of Hungryman Creek, Bear Creek, Little Bear Creek, the unnamed tributary within the Bear Creek drainage (AWC Stream Code 245-30-10135; Figure 3-1), and a portion of tidal areas associated with Tuxedni Bay. Additionally, approximately 21 acres of wetland and waters habitats would be included in the port area easement conveyance.

Brushing and creation of helicopter landing sites and drill pads could temporarily alter stormwater flows, potentially increasing erosion and sediment transport into aquatic habitats by reducing vegetative cover of the surrounding areas. Helicopter/drilling pads would occur throughout both transportation corridor easement options and within the expanded full port area easement. However, Option 2 has less restrictive Terms and Conditions than Options 3 and 4. The CIRI Terms and Conditions applicable to Option 2 do not require a spill prevention and response plan and fish habitat permits or include restrictions on releases of waste materials; boreholes in wetlands or standing water; or locating drill pads, helipads, and sumps near flowing water.

Drilled material, drilling fluids, or fuels have potential to enter aquatic habitats if not controlled or contained, which could result in mortality of fish. However, standard impact avoidance measures will be implemented during survey work, which include not discharging drilling materials directly into any standing or flowing water or vegetated areas and reporting any gross introduction of sediment/turbidity to a water source to NPS and the Alaska Department of Environmental Conservation immediately. With these Terms and Conditions, the potential impacts from accidental release of fuels and materials during Planning Phase activities are expected to be negligible.

Additionally, during drilling activities water would be pumped from the nearest source to mix drilling fluids for downhole use. These surface water withdrawals would temporarily lower stream flows and could have short-term effects on habitat availability. Should the hydrology of aquatic habitats be altered by water withdrawal, this could reduce the quality and quantity of habitat available for aquatic resources. Under worst case scenarios, this could result in stranding of individual fish during pumping activities.

Phases 2 and 3 – Construction and O&M

The transportation corridor easement would be reduced from 1,000 feet wide during Planning Phase actions to 250 feet wide and 100 feet wide for Construction and O&M, respectively (Table 1-2). CIRI has indicated that they would like the large port area for siting purposes and that it will be reduced in later phases; however, the extent of the reduction is not currently known. Because there are no site-specific designs or plans for Construction and O&M of the port or rail/road, including the alignment of the road/rail, the duration, extent, and severity of impacts to aquatic resources cannot be accurately estimated at this time.

Potential effects from Construction and O&M activities may include obstruction of fish access (through road/rail creation, culvert placement, etc.), localized increases in turbidity from road/rail and port construction, potential spills of fuels or other chemicals, and releases of excavated materials into freshwater systems (such as wetlands and streams) (Kravitz and Blair 2019). Direct mortality of aquatic resources (such as fish and aquatic invertebrates) may occur if individuals are crushed or stranded during construction, or if dewatering activities are required. All these effects may adversely impact aquatic resources within the easement areas, either by altering habitat quantity or quality, reducing forage species availability, or through direct mortality, although population level impacts are not expected.

Once sufficient detail is developed, additional environmental review and permitting, along with development of additional Terms and Conditions for these activities, would occur. All Construction activities in and adjacent to waterbodies would likely need to comply with the ADFG Fishway Act and Anadromous Fish Act, along with other best management practices, to minimize potential impacts. An Essential Fish Habitat assessment may be required by NMFS under the Magnuson–Stevens Fishery Conservation and Management Act.

Additional Impacts from Planned Actions

As part of the pending Cook Inlet Planning Area Oil and Gas Lease Sale 258, there is potential for oil and gas exploration and development in Cook Inlet (should the lease sale move forward). Aquatic habitat within the easement areas is not likely to be impacted by offshore oil and gas exploration. The construction of a port area for the Project could increase the amount of industrial activity, vessel operation, and shipping activities within Cook Inlet. This would inherently increase the potential for spills which could impact aquatic resources habitat within the easement areas.

A changing climate has increased temperatures across Alaska, including within the Park (Ballinger et al. 2023). As described in Section 3.9.1.1, an increase in temperature without significant increase in precipitation may dry wetlands in the area. Removal of wetlands from available habitat could impact the aquatic resources that rely on those habitats, although this is unlikely considering the scale of impacts to wetlands and waters. Additionally, warming water temperatures are known to impact the viability of a waterway for salmonid species (Mantua et al. 2010). Planning Phase activities will be temporary, and their impacts are unlikely to be additive to those presented by climate change.

3.3.2.3 Option 3 – Conveyance of North Transportation Corridor and Hungryman Creek Port Area

Phase 1 – Planning Phase Activities

The Option 3 transportation corridor contains approximately 12 acres of perennial rivers and streams, consisting of portions of Bear Creek and the Johnson River and one smaller tributary (AWC Stream Code 245-20-10170-2020-3001) (Figure 3-1). Additionally, approximately 104 acres of wetland and waters habitat (see Section 3.9.2.3, Table 3-5) would also be subject to the easement conveyed.

The Hungryman Creek port area easement would convey an easement covering approximately 1 acre of perennial waterbodies (see Section 3.9.2.3, Table 3-6) consisting of Hungryman Creek and a small amount of tidal areas associated with Tuxedni Bay. Additionally, approximately 24 acres of wetland and waters habitat would be included in the port area easement conveyance.

For Options 3 and 4, Planning Phase activities would occur June 1 through September 30 which overlaps with the upriver migration and spawning period for coho, chum, and pink salmon (ADFG 2024c). While there is a Term and Condition for this option to avoid crushing redds to the maximum extent practicable, there is still some potential for this to occur resulting in mortality of salmon eggs.

As with Option 2, drilled material, drilling fluids, or fuels have potential to enter aquatic habitats if not controlled or contained which could result in mortality of fish. Drilling activities will also require pumping of water from nearby sources, which could temporarily alter the availability and/or quantity of habitat available for aquatic resources. Additional impact avoidance measures

would be implemented during survey work for Options 3 and 4, which include conducting annual spill prevention and spill response procedure training, developing a spill prevention and response plan each year, locating spill kits at all drill and pump sites, using secondary containment methods for fuel, water pumps, and lubricating grease, not discharging drilling materials directly into any standing or flowing water or vegetated areas, and reporting any gross introduction of sediment/turbidity to a water source to NPS and the Alaska Department of Environmental Conservation immediately. With these Terms and Conditions, the impacts from accidental release of fuels and materials to aquatic resources during Planning Phase activities is expected to be negligible.

Brushing and creation of helicopter landing sites and drill pads could alter stormwater flows, potentially increasing erosion and sediment transport into aquatic habitats by reducing vegetative cover of the surrounding areas. However, per the proposed Terms and Conditions, helicopter landing sites will not be located within wetlands or standing water, and drill pads, helipads, and sumps will be kept at least 50 feet from flowing water. Avoiding these activities in the waterways reduces the potential for these activities to have a measurable impact on fish and macroinvertebrates under this option.

A complete list of impact avoidance measures and Terms and Conditions for this option is included in Section 2.5.

Due to the limited/short-term disturbances (lasting 5 years or less) associated with Planning Phase activities and the anticipated Terms and Conditions associated with this option, potential impacts to aquatic resources from these activities are anticipated to be negligible.

Phases 2 and 3 – Construction and O&M

Site-specific details, as well as potential Terms and Conditions, regarding the Construction and O&M of the road/rail and port area that could be constructed within the easements are not available. The duration, extent, and severity of potential impacts to aquatic resources as a result of Construction and O&M cannot be evaluated at this time.

The same potential impacts from these activities described under Option 2 are still present. Though the port area details are unknown, the port area easement under Option 3 is substantially smaller than that under Option 2, which could result in fewer impacts to aquatic resources if a smaller easement area were utilized for Construction/O&M compared to that under Option 2.

Additional Impacts from Planned Actions

Additional impacts from planned actions to aquatic resources from Option 3 would be the same as those described for Option 2.

3.3.2.4 Option 4 – Conveyance of South Transportation Corridor and Deep Water Port Area

Phase 1 – Planning Phase Activities

Approximately 14 acres of waterbodies and permanent waters would be subject to the easement conveyed as part of the southern transportation corridor, consisting of portions of Bear Creek and the Johnson River and one smaller tributary (AWC Stream Code 245-20-10170-2020-3001; Figure 3-1). Additionally, approximately 104 acres of wetland and waters habitats (see Section 3.9.2.4, Table 3-5) would also be subject to the easement conveyed.

The Deep Water port area easement would convey an easement covering approximately 9 acres of perennial waterbodies (see Section 3.9.2.4, Table 3-6) consisting of Little Bear Creek and the unnamed tributary within the Bear Creek drainage (AWC Stream Code 245-30-10135; Figure 3-1), and a small portion of tidal areas associated with Tuxedni Bay. Additionally, approximately 8 acres of wetland habitats would be included in the port area easement conveyance.

The locations of survey work and helicopter/drilling pads would differ under Option 4; however, the maximum number of landing sites/drilling pads would not change, and the same standard Terms and Conditions would be employed. Additionally, north of Bear Pass, the location of potential impacts to aquatic resources would shift to the south transportation corridor and Deep Water port area easements. Other than this location change, there would be little difference in potential impacts to aquatic resources between the north and south transportation corridor/port area easement options.

Phases 2 and 3 – Construction and O&M

As with Options 2 and 3, the duration, extent, and severity of potential impacts for all options related to Construction and O&M activities cannot be accurately estimated at this time due to the absence of engineering plans. Potential impacts from Construction and O&M would be the same as that for Option 3, albeit in different areas of the Bear Creek drainage in comparison to Option 3 (Option 4 utilizes the same transportation corridor as Option 3 within the Johnson River drainage).

Additional Impacts from Other Planned Actions

Additional impacts from other planned to aquatic resources from Option 4 would be the same as those described for Options 2 and 3.

3.3.2.5 Comparative Conclusion of Options

Under Option 1, the easements would not be conveyed for either a port or a transportation route and there would be no impacts to aquatic resources in the Project area.

Option 2 would result in the conveyance of an easement covering a substantially larger area than the other options, including 379 acres of aquatic resource habitat (wetlands, perennial and intermittent waters). The geographic extent of potential impacts to aquatic resources would be greatest under Option 2 compared to Options 3 and 4. Under Option 3, the north transportation corridor and the Hungryman Creek port area easement (Hungryman Creek) would be conveyed. This would result in 140 acres of aquatic resource habitat being potentially impacted. Option 4 would convey the south transportation corridor and the Deep Water port area easements (Deep Water), resulting in 138 acres of aquatic resource habitat being potentially impacted.

Under Option 2, Planning Phase activities would occur in both the north and south transportation corridors, resulting in a larger area of disturbance compared to Options 3 and 4. Additionally, this option has less restrictive Terms and Conditions compared to Options 3 and 4. As a result, the potential impact to aquatic resources could be substantially greater under this option, partially due to the larger area of disturbance, but primarily as a result of the less restrictive Terms and Conditions than those under Options 3 and 4.

The duration, severity, and extent of potential impacts from Planning Phase activities under Options 3 and 4 are expected to be similar. Although the locations of survey work and helicopter/drilling pads would differ between the options, approximately the same amount of disturbance is expected, resulting in minimal impacts to aquatic resources. Potential impacts to

aquatic resources include direct mortality due to crushing salmon redds and increased sedimentation from runoff and changes in surface flow. The potential for accidental spills and changes in local hydrology related to geotechnical investigations would be the same for both options.

Potential impacts to aquatic resources from Planning Phase actions are expected to be localized, short-term, and minimal in intensity for Options 3 and 4. The duration, extent, and severity of potential impacts for all options related to Construction and O&M activities cannot be accurately estimated at this time due to the absence of engineering plans.

3.4 WILDLIFE

3.4.1 Current and Expected Future Conditions of the Environment

The proposed easements support a variety of birds, terrestrial mammals, and marine mammals typical of coastal areas on the Alaska Peninsula, as described in the following sections. Few biological surveys have been conducted that overlap with the easement areas; therefore, the following sections rely on data from adjacent areas (such as the Johnson River Valley) and other Park sites to inform species occurrences and potential impacts.

3.4.1.1 Birds

Waterfowl

Waterfowl occur in association with open water or marshland habitats in the Park, and aerial surveys of bays, tidal estuaries, and coastlines have documented dabbling and diving ducks, sea ducks, geese, and loons occupying these areas. Dabbling ducks are most abundant during spring and fall migration, where thousands of ducks including mallards (*Anas platyrhynchos*), northern pintail (*Anas acuta*), green-winged teal (*Anas crecca*), American wigeon (*Mareca americana*), northern shoveler (*Spatula clypeata*), and others use the mouths of rivers and intertidal slough-mud flats for staging. The numbers of diving ducks, primarily greater (*Aythya marila*) and lesser scaup (*Aythya affinis*), peak during the spring migration, occurring almost exclusively in the intertidal zone of bays within 100 meters of the water's edge (KBBW 1997). Diving ducks do not appear to use the Park's coastline for staging during fall migration, unlike their dabbling duck counterparts (KBBW 1997). Sea ducks (primarily composed of scoters [*Melanitta* sp.]) occur in both intertidal and subtidal zones and are widely distributed within Tuxedni Bay, and they are the most abundant group of waterfowl in the Park throughout most of the year (Coletti et al. 2010; KBBW 1997). Geese, primarily Canada geese (*Branta canadensis*) occur almost exclusively within Tuxedni Bay within the Park, and mostly during fall migration (KBBW 1997). Loons were most abundant in the fall, and three species of loon (common loon [*Gavia immer*], Pacific loon [*Gavia pacifica*], and red-throated loon [*Gavia stellata*]) breed in the Park on near-coastal freshwater ponds (KBBW 1997).

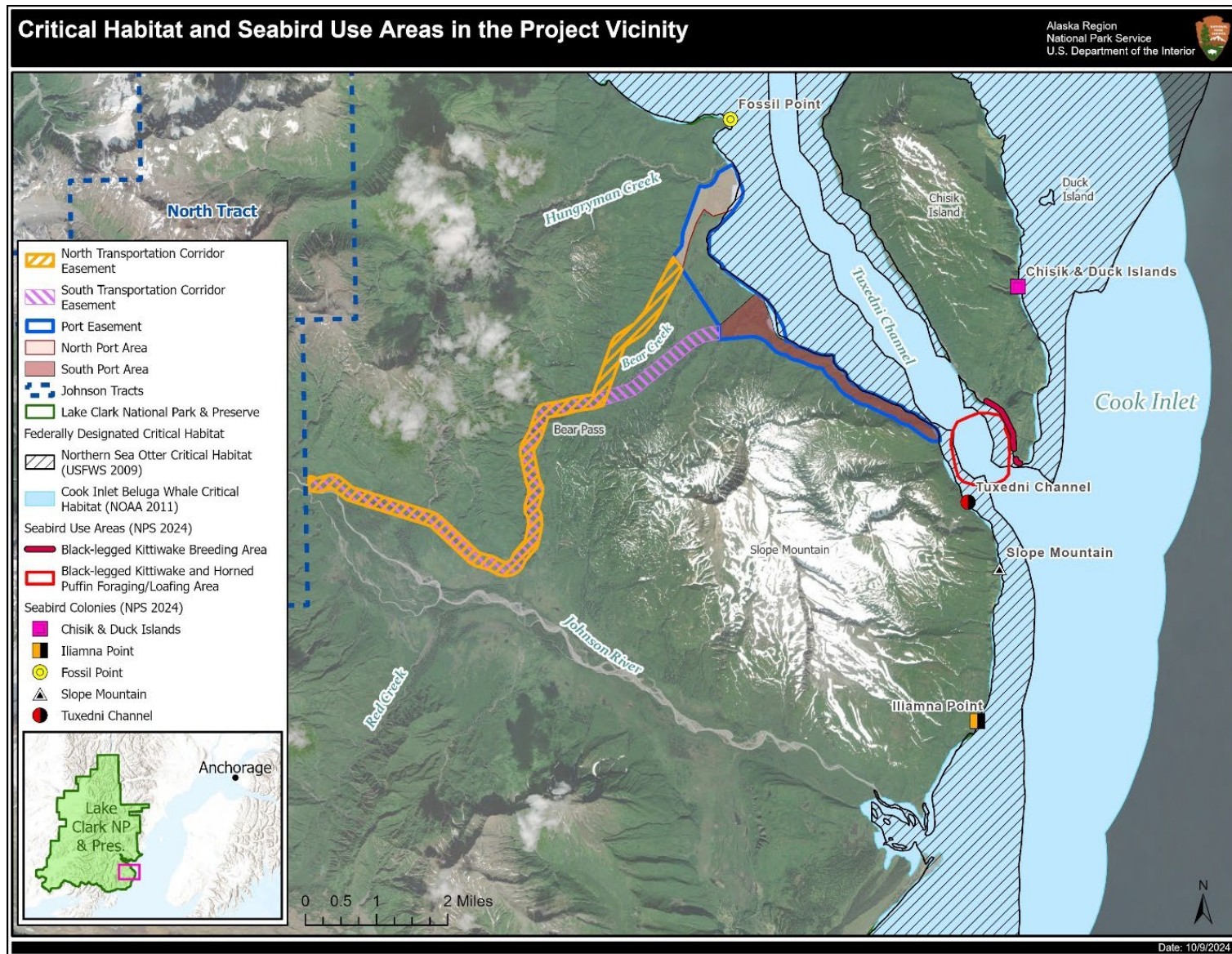
Shorebirds

Aerial and ground-based surveys for shorebirds along the Park's coastline were conducted in 1994 through 1996 (Bennett 1996). Peak arrival of shorebirds occurred in mid-May, but shortly after their abundance in the area quickly dropped off due to migration. The majority of shorebirds migrating through the area are composed of western sandpipers (*Calidris mauri*) and dunlins (*Calidris alpina*). While the Park's shorelines are an important resource for migrating shorebirds, they are not a significant breeding area for this group of birds (Bennett 1996).

Seabirds

Seabirds have been monitored along the Park coastline, and several nesting colonies exist in the vicinity of Tuxedni Bay/Channel (Figure 3-2). Most birds that frequent the Park coastline breed on Chisik Island directly across the Tuxedni Channel from the proposed port area easement locations (Bennett 1996). At least seven seabird colonies were documented along the Park coastline during surveys in 1994 through 1996, with five of the colonies occurring in the immediate vicinity of Tuxedni Bay and/or Channel (Bennett 1996). These colonies include Fossil Point, Chisik and Duck Islands (including the cliffs along the southwest side of Chisik Island at Snug Harbor), Tuxedni Channel, Slope Mountain, and Iliamna Point. Species documented at these colonies included black-legged kittiwakes (*Rissa tridactyla*), double-crested cormorants (*Nannopterum auritum*), glaucous-winged gulls (*Larus glaucescens*), horned puffins (*Fratercula orniculata*), pigeon guillemots (*Cephus columba*), and common murre (*Uria aalge*) (Arimitsu et al. 2021; Bennett 1996). Data collected from 1995 through 1999 indicated that some of these colonies, particularly colonies located on Chisik Island, were quite large. Counts of birds on Chisik Island during this period indicated that as many as 2,900 common murres and 16,500 black-legged kittiwakes were present on the island during the breeding season (Arimitsu et al. 2021). However, following a persistent marine heatwave that occurred in 2014 through 2016, populations of seabirds throughout the Gulf of Alaska, including Cook Inlet, declined sharply due to diminished forage fish prey availability as prey for seabirds. This was observed at colonies on Chisik Island as well, where breeding season counts that occurred after the heatwave (2016 through 2019) were reduced to an average of 798 (+/- 443) and 4,397 (+/- 1,397) birds for common murres and black-legged kittiwakes, respectively (Arimitsu et al. 2021). Coupled with low abundance, colony failures for common murres on Chisik Island were also documented (Arimitsu et al. 2021). The shoreline south of Snug Harbor on the west side of Chisik Island (Figure 3-2) is heavily utilized by black-legged kittiwakes. The waters located between this shoreline and the adjacent shoreline of the Park, within Tuxedni Channel, are major foraging/loafing areas for black-legged kittiwakes and horned puffin. Fossil Point is primarily a pigeon guillemot nesting colony, and Slope Mountain is primarily comprised of glaucous-winged gulls. The locations of a few of these seabird colonies have been compiled by the World Seabird Union (2024) and the Alaska Maritime National Wildlife Refuge, which are shown on Figure 3-2.

In part due to the abundance of seabirds that are associated with Chisik Island during the breeding season, Chisik Island and Duck Island were established as a refuge in 1909. Later, in 1970, they were designated a wilderness, and in 1980 became a subunit of the Gulf of Alaska Unit of the Alaska Maritime National Wildlife Refuge (Recreation 2024).



Note: The port easement boundary extends out to the mean high tide line. Mapping of federally designated critical habitat along the west side of Cook Inlet is imprecise as the shoreline is dynamic. The extent of federally designated critical habitat is not meant to overlap with the port easement boundary.

Figure 3-2. Critical Habitat and Seabird Use Areas in the Project Vicinity

Raptors

While numerous species of raptors occur in the Park, only a few were documented breeding in the vicinity of the proposed easements. These include bald (*Haliaeetus leucocephalus*) and golden eagles (*Aquila chrysaetos*), and peregrine falcons (*Falco peregrinus*) (ABR 2022; Bennett 1996). Bald eagle nests are widely distributed throughout the Johnson River Valley with 12 known nest sites. Three nest sites are known along the coastline in the Hungryman Creek and Bear Creek drainages (NPS unpublished data, n.d.-c). Nesting habitat for bald eagles is abundant in the form of cottonwood stands in the low-lying areas adjacent to streams (ABR 2022). Golden eagles were documented nesting in the Johnson Creek drainage near Kona Creek where suitable cliff nesting habitat is available. Bear Pass does not exhibit suitable cliff-nesting habitat due to a lack of large rock exposures (ABR 2022).

Passerines and Other Migratory Birds

Avian surveys conducted during the early breeding season (specifically, mid-May to early June) documented 104 migratory bird species utilizing montane (alpine) habitats within the Park (Ruthrauff et al. 2007). Combined with previous investigations, at least 166 bird species were documented within the Park, including at least 40 species of conservation concern (Ruthrauff et al. 2007). Species were documented in a variety of habitats, including forest, tall shrub, low shrub, dwarf shrub, bare ground, and herbaceous habitats (Ruthrauff et al. 2007). The proposed easement locations cross a wide variety of habitats, as they traverse the Park from the coast to relatively high elevations within the Johnson River drainage. Migratory birds occupying lower elevation riparian areas may include species like varied thrush (*Lxoreus naevius*) and Canada jay (*Perisoreus canadensis*). Middle elevation areas may be forested or shrub habitat, and may support species like golden-crowned sparrow (*Zonotrichia atricapilla*) and willow ptarmigan (*Lagopus lagopus*). High elevation, or alpine sites, commonly support rock ptarmigan (*Lagopus muta*) and snow bunting (*Plectrophenax nivalis*) (Ruthrauff et al. 2007). The majority of Alaska's bird species are migratory, and few species remain in the area year-round.

3.4.1.2 Terrestrial Mammals

Bears are common within the Park. Approximately 147 brown (*Ursus arctos*) and 136 black bears (*Ursus americanus*) per 1,000 square kilometers are estimated to occur along the Cook Inlet coast of the Park (Olson and Putera 2007). However, estimated bear density is variable based on habitat within the Park, with estimates ranging from 88 to 147 brown bears per 1,000 square kilometers (Crowley 2023). Within ADFG's Game Management Unit (GMU) 9A, which contains the proposed easement locations (and the Park), brown bear densities have been estimated to be at around 150 bears per 1,000 square kilometers (Crowley 2023).

During aerial surveys of the Park from 1994 through 1996, bears were observed frequently in marsh areas, including the Bear Creek Marsh area. However, only 0.5 percent of bear observations occurred in the Bear Creek Marsh despite this area possessing an estimated 8 percent of the Park's available salt marsh (a habitat type where bears frequently congregate) (Bennett 1996). NPS aerial survey data from 2003 through 2024 also indicate that bears use the Bear Creek drainage less frequently than other adjacent areas (for example, mouth of the Tuxedni River) (NPS unpublished data, n.d.-d).

Lastly, from 2021 through 2023, NPS affixed GPS collars to both black and brown bears to document bear use of the Park. While bears utilized the entire Johnson River drainage throughout the year, bears spent more time near marine environments or along the lower Johnson River Valley, where foraging opportunities are likely more abundant. Comparatively few collared bears were observed utilizing the Bear Creek drainage, although it should be noted

that bears utilizing this area may simply not have been collared or sampled (NPS unpublished data, n.d.-e).

Moose (*Alces alces*) are found throughout the Johnson River drainage (NPS unpublished data, n.d.-e). The middle and lower portions of the Johnson River Valley provide winter habitat with lower snow depth, numerous stands of willow (*Salix* sp.), and riparian areas associated with the river. The valley walls are steep and primarily vegetated with alder (*Alnus sinuata*) which bound moose habitat. Similar but more limited habitat conditions are likely present in the Bear Creek drainage, which likely explain the smaller number of moose observed there between 2019 and 2023 during late-winter aerial surveys (NPS unpublished data, n.d.-e). It is likely that quantity of habitat, the presence of predators (such as bear), and deep overwinter snow conditions restrict the population of moose in the area (CIRI 1993). Within the broader GMU 9A, data about the moose population are sparse. GMU 9A was estimated to support roughly 300 moose in 1983, but more recent surveys have not been conducted within GMU 9A by ADFG because it has “minimal populations and harvest, and consequently are of lowest priority for population monitoring” (Crowley 2017).

Other terrestrial mammal species that are known from the Park and may occur in the area include at least 24 species of small mammals, 8 species of carnivore (such as red fox [*Vulpes vulpes*], wolf [*Canis lupus*], Canada lynx [*Lynx canadensis*], wolverine [*Gulo gulo*]), porcupine (*Erethizon dorsatum*), and North American beaver (*Castor canadensis*) (NPS 2003). While Dall’s sheep and caribou are specifically mentioned in the park’s enabling legislation (ANILCA, Section 201) it is worth noting that they are not known to occur within the project area and instead occur in the interior regions of the park.

3.4.1.3 Marine Mammals

Numerous marine mammal species occur within Cook Inlet and Shelikof Strait (Calkins and Curatolo 1979), and some are known to regularly occur along the Park’s coastlines. Harbor seals (*Phoca vitulina richardii*), harbor porpoise (*Phocoena phocoena*), Cook Inlet beluga whales (*Delphinapterus leucas*), northern sea otter (*Enhydra lutris*), Steller’s sea lion (*Eumetopias jubatus*), killer whales (*Orcinus orca*), and humpback whales (*Megaptera novaeangliae*) were documented in this area (Castellote et al. 2024; Bennett 1996; NMFS 2024). Species with federal protection under the Endangered Species Act of 1973 (ESA) are discussed separately in Section 3.6 (such as Cook Inlet beluga whale, Steller’s sea lion, and northern sea otter).

Supported by the DOI Bureau of Ocean and Energy Management, the National Marine Mammal Laboratory conducted aerial surveys in Cook Inlet from 2003 through 2005 to estimate the abundance and distribution of hauled out harbor seals. Harbor seals are common in Cook Inlet, and timing of the surveys coincided with pupping (June) and molting (August) as well as during the non-breeding months of October and April (Boveng et al. 2011). Survey units encompassed the Park coastline, Tuxedni Bay, and the Johnson River area. Estimates of hauled out harbor seals from the greater Tuxedni Bay area (which include JF02, JF03, and JF04 survey units) ranged from about 25–135 (April/June) to 30–350 (August/October). The JF04 survey polygon, which is directly seaward of the proposed easement area, had counts of around four harbor seals hauled out during the survey (Boveng et al. 2011). Telemetry studies were also conducted that provided insight to year-round seal movements and areas of use and were not restricted to just counts of hauled out seals. Based on telemetry data, during April through July (June is pupping) the entirety of the Park coastline (including Tuxedni Bay and the Johnson River delta) supports some of the highest harbor seal activity. Activity decreased in the winter months as harbor seals move into Shelikof Strait to forage (Boveng et al. 2012).

Harbor porpoise are also relatively abundant in Tuxedni Bay, and acoustic monitoring in the bay indicated that the species is present on an almost daily basis from late September through early January, and from mid-February through late May (Castellote et al. 2024).

3.4.1.4 Additional Trends and Planned Actions

As part of the Cook Inlet Planning Area Oil and Gas Lease Sale 258, there is potential for oil and gas exploration and development in Cook Inlet (should the lease sale move forward). Additionally, a small but growing portion of visitors to the Park engage in bear viewing in Tuxedni Bay through commercial operators, potentially increasing human presence and disturbance in the area.

Climate change is an additional trend that has increased temperatures across Alaska in recent years (Ballinger et al. 2023). For the Park, this has resulted in increased temperatures along its coastline, while precipitation has remained fairly constant. Specific impacts to wildlife species resulting from climate change can be difficult to determine before they occur. However, as described in Section 3.9.1.1, an increase in temperature without significant increase in precipitation may alter the hydrology of the area. This could impact aquatic resources, and any impacts to aquatic resources could have additional impacts to wildlife species that rely on fish for foraging (seabirds, waterbirds, bears, marine mammals). Additionally, changes in water temperature can have far-reaching consequences in both freshwater systems and marine systems. This was observed in marine waters during recent heat waves that reduced forage fish availability (Arimitsu et al. 2021), and in fresh water where warming water temperatures are known to impact the viability of a waterway for salmonid species (Mantua et al. 2010). These climate-related changes could impact wildlife species by decreasing the availability of their prey species.

There are no plans for other management changes in the proximity of the Project that would impact wildlife resources. The Park and the surrounding areas would continue to be managed in ways similar to current conditions.

3.4.2 Environmental Consequences

3.4.2.1 Option 1 – No Action

Impacts of Option 1

Under Option 1, the easements would not be conveyed for either a port or a transportation route and the conditions of ANCSA and the 1976 Act would not be fulfilled. As a result, impacts to wildlife would be the same as described above, in the “Current and Expected Future Conditions of the Environment.”

Additional Impacts from Planned Actions

Under Option 1, an easement would not be conveyed and there would be no impacts to wildlife; therefore, the environment would remain the same as or similar to the “Current and Expected Future Conditions of the Environment” section. Past, present, and reasonably foreseeable actions and their impacts would be the same as those described in the “Current and Expected Future Conditions of the Environment” section.

3.4.2.2 Option 2 – CIRI’s Initial Proposal

Phase 1 – Planning Phase Activities

Under Option 2, approximately 120 acres of wetlands and waters and 1,144 acres of upland habitat would be subject to the easement conveyed within both transportation corridor areas;

and 259 acres of wetlands and waters and 1,047 acres of upland habitat would be subject to the easement conveyed within the full port area easement (see Section 3.9.2).

Most wildlife species would be unaffected by pedestrian surveys of the area or would exhibit temporary changes in behavior that would likely return to baseline conditions once surveyors leave the immediate area and Planning Phase activities cease. Waterfowl, shorebirds, raptors, and other birds may flush and leave the area upon surveyors' arrival. Nesting bird species may be flushed from active nests in the area but would likely return once surveyors depart (as surveyors are unlikely to remain in an area for prolonged periods), and nest failure is unlikely.

Terrestrial mammals would be similarly impacted by pedestrian surveys, and species like moose or bear are likely to avoid areas where surveyors are working. This may result in temporary displacement of preferred foraging and resting areas. The potential for human-wildlife conflict will increase, potentially resulting in wildlife mortality. However, implementation of typical large wildlife avoidance strategies during pedestrian surveys would result in little risk of human-wildlife conflict events resulting in the mortality of terrestrial mammals. For Option 2, these would include maintaining a 1-kilometer distance from a freshly excavated bear den or a bear denning location.

Use of helicopters in the area has potential to disturb wildlife in the easement areas and beyond (since noise generated from helicopter use would extend beyond the easement boundaries). For avian species, this could result in flushing and avoidance of the area, potential nest failure if birds abandon the area for extended periods of time, or if rotor downwash causes nest failure. This would include seabird species that form colonies on Chisik Island and the Park's coastal areas, meaning that one helicopter overflight could impact a large number of seabirds concentrated in a small area.

Clearing of vegetation for the creation of landing pads is unlikely to directly impact large terrestrial animals, which would likely avoid areas with an abundance of human activity and recent helicopter use. Small mammals that are unable to leave the area may be crushed by landing activities or vegetation clearing. Additionally, larger terrestrial mammals may be similarly impacted by helicopter use as migratory birds, where individual animals may be disturbed and leave the area. These species may also avoid the area when helicopters/humans are present within the easements. Additionally, some species may have areas important for life history activities, such as foraging, resting, or denning, that occur within the easement area. In these instances, individual animals may abandon these important areas or alter their behavior in adverse ways. For instance, during prolonged use of helicopters in the area, more mobile species (such as bears, moose) may leave the area altogether, potentially avoiding areas important for foraging (such as shorelines or river systems) or denning (such as bear dens).

The creation of geotechnical drilling pads may disturb wildlife within the easement areas. Placement of wooden beams and the creation of the pads is unlikely to have direct impacts to larger, mobile terrestrial wildlife, but may have direct impacts to smaller animals that are unable to avoid the habitat disturbance. Wildlife may avoid drilling areas during their operation when increased terrestrial noise and human presence occur. If drilling pads are created in high use areas, or within or adjacent to important wildlife activity centers (such as near salmon spawning streams that tend to congregate wildlife), they may interrupt important biological processes.

In general, CIRI's Terms and Conditions are less protective of wildlife and could result in adverse effects to avian species, terrestrial mammals, and marine mammals during planning phase activities. For example, in the case of avian species, CIRI's Terms and Conditions include visual inspection of nests for state and federally listed birds and maintaining a distance of 100

feet for geotechnical drill sites. This distance is likely insufficient for many avian species, including bald eagles, which could result in adverse effects to avian species due to flushing, stress, and nest abandonment. Additionally, there are no Terms and Conditions to avoid impacts of helicopters or fixed-wing aircraft to avian species which could result in direct mortality, flu storage of attractants or helicopter/flight operations which, as described above, could result in increased adverse effects to terrestrial mammals.

Phases 2 and 3 – Construction and O&M

The transportation corridor easement would be reduced from 1,000 feet wide during Planning Phase actions to 250 feet wide and 100 feet wide for Construction and O&M, respectively (Table 1-2). CIRI has indicated that they would like the large port area for siting purposes and that it will be reduced in later phases; however, the extent of the reduction is not currently known. Because there are no site-specific designs or plans for Construction and O&M of the port or rail/road, including the alignment of the road/rail, the duration, extent, and severity of impacts to wildlife species cannot be accurately estimated at this time; however general impacts to wildlife species anticipated to occur from these activities are discussed below. Once sufficient detail is developed, additional environmental review and permitting, along with development of additional Terms and Conditions for these activities, would occur.

Within the transportation corridor, permanent habitat loss would occur at the site of road/rail construction. Animals in the area may lose access to wetland/water and upland habitat types, depending on road/rail siting. Within the Johnson River and Bear Creek drainages, habitat loss would be relatively small compared to the total availability of similar habitats. However, while direct impacts to wildlife habitat may be small compared to local availability, indirect impacts to wildlife species may be more extensive. Use of the proposed transportation road/rail would create noise, dust, visual disturbance, and potential for mortality through wildlife collisions along the road/rail (Trombulak and Frissell 2000). The potential for wildlife conflict would also increase, as there are currently no roads in this area of the Park. Wildlife may also avoid the area during Construction and O&M activities. Habitat connectivity may also be impacted by the road/rail system, where direct habitat loss and avoidance of the transportation road/rail may effectively isolate populations of wildlife or interrupt seasonal movements between areas (Trombulak and Frissell 2000). For instance, bears within the Johnson River drainage may be less likely to use the Bear Creek drainage when a transportation road/rail separates the two, even if relatively few vehicles use the road/rail (McLellan and Shackleton 1988). Consequently, while direct habitat loss may be limited to the road/rail footprint, indirect habitat loss through the avoidance of a transportation road/rail may be more extensive. The area of avoidance around the road/rail varies per species, but the indirect habitat loss through avoidance is greater than the actual road/rail footprint.

Development of the port may have similar impacts to terrestrial wildlife species as development of transportation roads. Terrestrial species may avoid the port area during Construction and O&M, and would also experience direct habitat loss from the development of the port area itself. In particular, bears that feed in sedge meadows along Cook Inlet may avoid preferred foraging areas depending upon the location of the port. Additionally, marine mammals may be negatively impacted by the increased underwater noise from the operation and loading/unloading of marine vessels (Castellote et al. 2024). Increased noise in the marine environment can mask both prey detection and predator detection, simultaneously impacting a marine mammal's ability to obtain food and avoid predators. Additionally, the increase in

marine vessels travelling between the port area and other areas of Cook Inlet may further decrease the quality of marine habitat throughout the region by introducing increased underwater noise, human disturbance, potential for accidental fuel/oil/other substance releases and spills (discussed previously in Section 3.2.2 under Hazardous Materials), and potential for injury and mortality from vessel collisions.

There is also potential that the Construction and O&M of port/transportation facilities may impact prey species that wildlife species rely on. As described in Section 3.3.2, aquatic resources may be impacted by construction of a transportation corridor (potentially through localized increases in turbidity, releases of excavated materials into freshwater systems, or direct mortality). As many wildlife species rely on aquatic resources (such as bears that feed on fish resources in the Johnson River and Bear creek drainages, or marine mammals that feed on fish in the marine environment), impacts to aquatic resources resulting from development of the easement areas may also impact wildlife resources.

Impacts to wildlife species, including marine mammals, are anticipated to be increased underwater noise from the operation and loading/unloading of marine vessels, increases in marine vessel traffic throughout the region, potential for accidental spills/fuel/oil releases, and direct and indirect habitat loss from the development of the port itself.

Additional Impacts from Planned Actions

As part of the Cook Inlet Planning Area Oil and Gas Lease Sale 258, there is potential for oil and gas exploration and development in Cook Inlet (should the lease sale continue). Most terrestrial wildlife resources within the easement areas would be unlikely to be impacted by offshore oil and gas exploration. However, those species that are associated with nearshore or tidal areas (for example, bears that forage along coastlines) may be impacted by any decrease in water quality that may result from oil and gas exploration. The construction of a port for the Project would increase the amount of industrial activity, vessel operation, and shipping activities within Cook Inlet, and these effects would be additive to similar effects produced by oil and gas exploration. This may increase the potential for spills or cause an increase in underwater noise and human disturbance, potentially impacting wildlife resources (for example, marine mammals) in the region.

While Planning Phase activities are unlikely to be additive to climate change due to their temporary nature, the impacts of development of a permanent port and transportation corridor could exacerbate stressors on wildlife populations experiencing the effects of climate change.

3.4.2.3 Option 3 – Conveyance of North Transportation Corridor and Hungryman Creek Port Area

Phase 1 – Planning Phase Activities

Approximately 116 acres of wetlands and waters and 920 acres of upland habitat would be subject to the easement conveyed within the north transportation corridor, and 24 acres of wetlands and waters and 240 acres of upland habitat would be subject to the easement conveyed within the Hungryman Creek port area easement (see Section 3.9.2).

Generally, impacts to wildlife from Planning Phase activities are anticipated to be similar in nature to those described previously for Option 2, as both options include the same types of activities. However, the Planning Phase activities under Option 3 would occur over a smaller area (only the north transportation corridor and Hungryman Creek port area easement would be subject to conveyance), and additional Terms and Conditions would apply to Planning Phase activities occurring under this option. These include a variety of measures intended to reduce

the risk of human-wildlife conflicts, reduce the impact of helicopter/aircraft use, reduce the impact of vegetation clearing and geotechnical/helicopter pad creation, and reduce impacts to wildlife from human presence. The Terms and Conditions for Option 3 are also more aligned with federal regulations protecting migratory birds, bald eagles, and marine mammals. Consequently, impacts to wildlife resources from Planning Phase activities under Option 3 are anticipated to be temporary, limited in extent, and less than those under Option 2.

Phases 2 and 3 – Construction and O&M

As with Option 2, there are no site-specific designs or plans for Construction and O&M of the port or rail/road, including the alignment of the road/rail. Consequently, the duration, extent, and severity of impacts to wildlife cannot be accurately estimated at this time. Once sufficient detail is developed, additional environmental review and permitting, along with development of additional Terms and Conditions for these activities, would occur.

General impacts to wildlife species, including marine mammals, from the Construction and O&M of the transportation corridor and port area easements under Option 3 are anticipated to be similar to those Option 2. Potentially less area could be subject to development under this option as a smaller area would be subject to the easement conveyance. Specific to seabirds, Option 3 would have a lower impact on seabirds compared with Option 2, since the Hungryman Creek port area is located away from the majority of known seabird colonies at the south end of Chisik Island. The Fossil Point pigeon guillemot seabird colony is located approximately 1 kilometer north of the Hungryman Creek port area and has a potential to be impacted by activities at the port area easement.

Like Option 2, it is anticipated that potential impacts to terrestrial wildlife species from Construction and O&M of the transportation corridor easement area would include direct habitat loss; decreased habitat quality from noise, dust, and human disturbance; increased potential for injury and mortality through wildlife collisions along the road; and potential impacts to wildlife habitat connectivity.

Impacts to wildlife species, including marine mammals, from the development and O&M of the port area easement are anticipated to be increased underwater noise from the operation and loading/unloading of marine vessels, potential for accidental spills and fuel/oil releases, increases in marine vessel traffic throughout the region (resulting in potential injury and mortality to marine mammals), and direct and indirect habitat loss from the development of the port itself.

Additional Impacts from Planned Actions

Impacts would be the same as described for Option 2.

3.4.2.4 Option 4 – Conveyance of South Transportation Corridor and Deep Water Port Area

Phase 1 – Planning Phase Activities

Under Option 4, approximately 118 acres of wetlands and waters and 885 acres of upland habitat would be subject to the easement conveyed within the south transportation corridor; and 20 acres of wetlands and waters and 529 acres of upland habitat would be subject to the easement conveyed within the Deep Water port area easement (see Section 3.9.2).

Impacts from the implementation of Planning Phase actions under Option 4 to wildlife species are anticipated to largely be the same as those described under Option 3. The Option 4 transportation corridor is located less than a mile south of Option 3, and, generally, there are no

major differences in the habitats and wildlife communities between the two transportation corridors. The primary differences are the locations of the south transportation corridor (which is south of Bear Creek, an anadromous stream that bears likely use for foraging), and the port area easement.

Since the Option 4 transportation corridor is farther away from Bear Creek, disturbances from Planning Phase actions are less likely to impact bear foraging. Planning Phase actions that occur in the Deep Water port area would be near important foraging/loafing areas for black-legged kittiwakes and horned puffin resulting in greater impacts to these species compared to Option 3.

Phases 2 and 3 – Construction and O&M

As with Options 2 and 3, there are no site-specific designs or plans for Construction and O&M of the port or rail/road, including the alignment of the road/rail. Consequently, the duration, extent, and severity of impacts to wildlife cannot be accurately estimated at this time. Once sufficient detail is developed, additional environmental review and permitting, along with development of additional Terms and Conditions for these activities, would occur.

General impacts from the Construction and O&M of a transportation corridor under Option 4 to wildlife species are anticipated to be largely the same as those described under Option 3. Since the Option 4 transportation corridor is farther away from Bear Creek, construction of a road/rail are less likely to impact brown bear foraging. It is anticipated that potential impacts to terrestrial wildlife species would continue to be direct habitat loss, decreased habitat quality through the creation of noise, dust, human disturbance, increased potential for mortality through wildlife collisions along the road/rail, potential impacts to wildlife habitat connectivity, and potential impacts to prey species.

Impacts to wildlife species from the creation of the port area (including marine mammals) are anticipated to be similar to Option 2 since both proposed port area easements would result in similar types of Construction and O&M activities and subsequent development occurring within the easements (albeit in different locations). The Deep Water port area is located opposite an important seabird nesting colony (at Snug Harbor and Tuxedni Channel) and adjacent to important seabird feeding and loafing/resting area (Figure 3-2). The nearest point between the Deep Water port area and the closest seabird colony nesting area is approximately 1.3 kilometers. However, the Deep Water port area is located further from Fossil Point pigeon guillemot seabird colony than the port area under Option 3. The potential for an accidental oil spill or other hazardous material release into the marine environment could have disastrous impacts on nesting, foraging, and loafing seabirds close to the port area.

Additional impacts are anticipated to be increased underwater noise from the operation and loading/unloading of marine vessels and increases in marine vessel traffic throughout the region. These impacts may mask important acoustic cues or decrease the habitat viability due to the presence of human activities. Increased vessel traffic in Tuxedni Channel can lead to increased vessel strike and potential for spills.

Additional Impacts from Planned Actions

Impacts would be the same as those described for Option 2.

3.4.2.5 Comparative Conclusion of Options

Under Option 1, the easements would not be conveyed for either a port or a transportation route and there would be no additional impacts to wildlife resources in the Project area.

Option 2 would result in the conveyance of an easement covering a substantially larger area than the other options, including a combined total of 2,191 acres of upland habitat and 379 acres of wetlands and waters for the transportation corridors and port area. Under Option 3, the north transportation corridor and the Hungryman Creek port area easement would be conveyed. This would result in a combined total of 1,160 acres of upland habitat being subject to the easement conveyed, along with a total of 140 acres of wetlands and waters. Option 4 would convey the south transportation corridor and the Deep Water port area easement, resulting in a combined total of 1,414 acres of upland habitat and 138 acres of wetlands and waters being subject to the easement conveyed as well.

Planning Phase activities for all Options could impact wildlife resources, including seabird colonies occurring on Chisik Island and within Tuxedni Channel or bears and other wildlife occurring in the easement areas. Helicopter use and geotechnical investigations will most likely temporarily impact wildlife resources due to potentially loud noise associated with these activities and/or intermittent human presence in the area. While the same Planning Phase activities would occur under Options 2, 3, and 4 (such as the number of boreholes and helicopter landing pads), the general locations of those activities would be different between the options. However, Option 2 contains less protective Terms and Conditions than Options 3 and 4 regarding wildlife, including eagles and migratory birds, resulting in the greater adverse impacts to wildlife under Option 2. The Terms and Conditions for Option 2 that are protective of wildlife include a minimum separation distance of 1 kilometer from a freshly excavated bear den or a bear denning and a restriction on drill sites within 100 feet of active nests of state and federally listed birds (confirmed through a visual inspection during active migratory bird nesting seasons). While these measures help to reduce or avoid impacts to bears and active nests of state and federally listed birds, they do not include protective measures for working near bald eagle nests, migratory bird nests (only nests of state and federally listed species), seabird colonies, and are substantially less protective of wildlife described under the Terms and Conditions for Options 3 and 4. The Terms and Conditions for Options 3 and 4 include measures to protect marine mammals, seabirds, all migratory birds (not just state and federally listed birds), bald eagles, and bears. Therefore, the Terms and Conditions for Options 3 and 4 are more encompassing and protective for all wildlife resources that have the potential to be impacted by Planning Phase activities, as opposed to the Option 2 conditions, which apply only to bears and state and federally listed bird nests.

Options 2, 3, and 4 could all result in impacts to wildlife resources through the Construction and O&M of the transportation corridor. Animals in the area may lose access to certain habitat areas (from habitat fragmentation), depending on road/rail siting. Use of the transportation corridor(s) would create increased noise, dust, visual disturbance, and potential for mortality through wildlife collisions along the road/rail. The potential for wildlife conflict would also increase, as there are currently no roads in this area of the Park. Habitat connectivity may also be impacted by the transportation system, where direct habitat loss and avoidance of the transportation road/rail may effectively isolate populations of wildlife or interrupt seasonal movements between areas.

Development of the port may have similar impacts to terrestrial wildlife species as development of the transportation corridor. Terrestrial species may avoid the port area during Construction and O&M, and would also experience direct habitat loss from the development of the port area itself. Seabirds may experience increased risk of accidental oil/hazardous material spills due to the adjacency of seabird nesting colonies. Marine mammals may be negatively impacted by the increased underwater noise from the operation and loading/unloading of marine vessels and

potential for accidental oil/hazardous material spills. Additionally, the increase in marine vessels travelling between the port area and other areas of Cook Inlet may further decrease the quality of marine habitat throughout the region.

Under Option 4, the Deep Water port area is located opposite an important seabird nesting colony (at Snug Harbor and Tuxedni Channel) and adjacent to important seabird feeding and loafing/resting area (Figure 3-2) which could result in greater impacts to seabirds compared to Option 3. However, under Option 3, greater impacts could occur to the Fossil Point pigeon guillemot seabird colony which is located approximately 1 kilometer north of the Hungryman Creek port area.

The transportation corridor under Option 4 is farther away from Bear Creek, and therefore construction of a road/rail are less likely to impact brown bear foraging compared to Option 3.

For Options 2, 3, and 4, the potential for Construction and/or O&M of the various facilities to impact prey species, both for terrestrial wildlife species (bears) and for marine wildlife species (marine mammals). Again, the duration, extent, and severity of potential impacts related to Construction and O&M activities for all Options cannot be accurately estimated at this time due to the absence of engineering plans.

3.5 CULTURAL RESOURCES

3.5.1 Current and Expected Future Conditions of the Environment

Records on file at the Alaska Office of History and Archaeology were reviewed to determine the extent of previous cultural resource studies and known cultural resources within the Project area. A records search of the Alaska Heritage Resources Survey Portal identified four sites in the Deep Water port area easement section of the Project area, identified in a 2023 reconnaissance survey (AHRS 2024; Schwaderer 2024). No previously recorded sites were identified in either the north or south transportation corridor easements, nor in the Hungryman Creek port easement section of the Project area.

The NPS NRHP database was also reviewed to determine if NRHP-listed properties are located within the Project area. No NRHP-listed properties were identified in the Project area (NPS 2024c); however, the Snug Harbor Packing Company historic district, located on Chisik Island directly across from the Deep Water port easement area, was listed on the National Register in September 2023. The Snug Harbor Packing Company historic district is locally significant under Criteria A and B in the areas of Maritime History, Industry, Commerce, Social History, Ethnic Heritage-Alaska Native, Ethnic Heritage-Asian, and Ethnic Heritage-European. Historic vistas/viewsheds are mentioned in the NRHP nomination as a character-defining feature.

A General Management Plan Amendment was completed for the Park in January 2014. The Project area falls within the area of the General Management Plan, but no cultural resources in the Project area were identified by NPS in this plan.

In July 2023, CIRI contractors conducted a reconnaissance survey on approximately 1,241 acres in and around the port easement area and north and south transportation corridor easement areas. The purpose of this work was to inspect the Project area, generally characterize its resources, and provide information for future surveys. The reconnaissance survey completed in 2023 did not constitute a Phase I (Identification) Survey of the Project area. The reconnaissance survey identified two High Probability Areas and four newly recorded cabin sites (Schwaderer 2024).

High Probability Area 1, identified through desktop examination of topography, aerial imagery, and helicopter overflights in 2022, falls within the north and south transportation corridor easement area at the summit of Bear Pass. Limited pedestrian survey and subsurface testing in this area in 2023 did not identify any buried cultural resources. Based on the reconnaissance work, it is recommended that High Probability Area 1 instead be considered an area of moderate probability to contain prehistoric, protohistoric, and historic cultural resources. (Schwaderer 2024).

High Probability Area 2 is located within the Deep Water port easement area of the Project. Five structures and one cultural depression (comprising four sites) were identified in this area (KEN-00814, KEN-00815, KEN-00816, and KEN-00817). Two of the sites are described as potentially eligible for listing on the NRHP (KEN-00814 and KEN-00815), although no eligibility determinations have been made. The reconnaissance survey in High Probability Area 2 included 2 days of pedestrian survey at the northern and southern ends of the area and limited metal detecting at KEN-00814. No subsurface testing was conducted. Based on the reconnaissance work, it is recommended that High Probability Area 2 be considered an area of high probability to contain prehistoric, protohistoric, and historic cultural resources (Schwaderer 2024).

The North Survey Area, which was 344 acres of land in the Hungryman Creek port area and the portion of the north transportation corridor that is separate from the south transportation corridor, was only examined through helicopter overflights because of a combination of dense vegetation and high levels of bear activity in July 2023. Portions of the North Survey Area around the mouth of Hungryman Creek and along the shore of Tuxedni Channel as well as portions of the South Survey Area, which was 897 acres in the Deep Water port area and the south transportation corridor, along the shore of the Tuxedni Channel and around the mouths of unnamed creeks are considered to have a higher potential to contain intact prehistoric, protohistoric, and historic cultural resources due to the presence of fresh water, elevated ground, naturally occurring windbreaks, and access to terrestrial and marine resources (Schwaderer 2024).

Details about the Section 106 process are included in Section 4.3 of this RA.

3.5.1.1 Additional Trends and Planned Actions

As part of the Cook Inlet Planning Area Oil and Gas Lease Sale 258 (which took place December 30, 2022), there is potential for oil and gas exploration and development in Cook Inlet; however, a July 2024 judicial ruling suspended the lease sale (U.S. District Court of Alaska Case No. 3:22-cv-00279-SLG). It is unclear if the lease sale will be permitted at this time. If oil and gas exploration happens as a result of this lease sale, impacts could occur to cultural resources if leaked contaminants or a spill from exploration and development reaches cultural resource-bearing soils. Climate change could also impact cultural resources as environmental factors become more extreme, including temperature changes, sea level rise, and precipitation changes, which could expose previously buried cultural resources or expose them to air, water, weather events, and extreme temperatures that could affect them.

There are no additional trends or planned actions that would impact known eligible, ineligible, or as-yet unidentified cultural resources in the Project area. There are no plans for other management changes in the proximity of the Project that would impact cultural resources. The Park and the surrounding areas would continue to be managed in ways similar to current conditions.

3.5.2 Environmental Consequences

3.5.2.1 Option 1 – No Action

Impacts of Option 1

Under Option 1, the easements would not be conveyed for either a port or a transportation route and the conditions of ANCSA and the 1976 Act would not be fulfilled. As a result, impacts to cultural resources would be the same as described above in the “Current and Expected Future Conditions of the Environment.”

Additional Impacts from Planned Actions

Under Option 1, an easement would not be conveyed and there would be no impacts to cultural resources; therefore, the environment would remain the same as or similar to the “Current and Expected Future Conditions of the Environment” section. Past, present, and reasonably foreseeable actions and their impacts would be the same as those described in the “Current and Expected Future Conditions of the Environment” section.

3.5.2.2 Option 2 – CIRI’s Initial Proposal

Phase 1 – Planning Phase Activities

Under Option 2, the north and south transportation corridor easement areas would cross High Probability Area 1 at the summit of Bear Pass. In 2023, archeologists conducted a pedestrian reconnaissance survey of five cabins with associated outbuildings and one cultural depression within High Probability Area 2, which is located in the Deep Water port easement area. Two of the five cabins can be preliminarily dated to 50 years of age or older, making them potentially eligible for listing on the NRHP. High Probability Area 2 is considered an area of high probability to contain prehistoric, protohistoric, and historic cultural resources (Schwaderer 2024). The northernmost tip of the Hungryman Creek port easement area, near the mouth of Hungryman Creek, was identified as having high potential for prehistoric, protohistoric, and historic settlement and may contain unidentified cultural resources (Schwaderer 2024). There is potential for effects to as-yet-unidentified cultural resources from the Planning Phase activities.

Geotechnical borings and any associated subsurface disturbance have the potential to impact cultural resources should they be present in these areas. However, because CIRI must comply with the terms of the Section 106 programmatic agreement that will be executed prior to the conveyance of the easements, which would require avoidance and/or minimization of impacts to cultural resources from ground disturbance/boreholes greater than 2 inches in diameter, Planning Phase activities would have negligible impacts to cultural resources. All natural and cultural resources discovered in the easement areas are the property of the United States.

Phases 2 and 3 – Construction and O&M

The transportation corridor easement would be reduced from 1,000 feet wide during Planning Phase actions to 250 feet wide and 100 feet wide for Construction and O&M, respectively (Table 1-2). CIRI has indicated that they would like the large port area for siting purposes and that it will be reduced in later phases; however, the extent of the reduction is not currently known. Because there are no site-specific designs or plans for Construction and O&M of the port or rail/road, including the alignment of the road/rail, the duration, extent, and severity of impacts to cultural resources cannot be accurately estimated at this time. Once sufficient detail is developed, additional environmental review and permitting, along with development of additional Terms and Conditions for these activities, would occur. Additionally, before

Construction commences, CIRI will be required to choose either the north or south transportation corridor.

Construction and O&M activities may adversely impact existing and previously unknown cultural resources, specifically in the Hungryman Creek port easement area, Deep Water port easement area, and north of Bear Pass within the south transportation corridor area.

Construction and O&M has the potential to disturb archeological resources and could diminish site integrity of previously identified cultural resources. Additionally, there is potential to impact the four previously identified sites in the Deep Water port easement area. Impacts would need to be avoided, minimized, or mitigated as part of the Section 106 consultation process prior to construction. An inadvertent discovery plan will be included as part of the Section 106 programmatic agreement and implemented by CIRI in consultation with NPS to avoid, minimize, and mitigate impacts during Construction and O&M.

Option 2 has the potential to impact the Snug Harbor Packing Company historic district, located on Chisik Island outside of the Project area. Option 2 would likely have auditory, visual, or atmospheric impacts on the setting and feeling of Snug Harbor Packing Company historic district. Visual, auditory, and atmospheric impacts from Construction and O&M to the setting and feeling of the Snug Harbor Packing Company historic district would be estimated once plans and details are available and, if appropriate, mitigation measures developed to minimize impacts.

Additional Impacts from Planned Actions

Overall, the impacts of other trends and planned actions that may affect cultural resources are described above in the “Current and Expected Future Conditions of the Environment.” As discussed, oil and gas development in Cook Inlet could result in degradation to cultural resources in the event of a leak or spill. Climate change could also impact cultural resources due to temperature changes, precipitation changes, and sea level rise. There are no additional impacts to cultural resources anticipated from any planned actions.

3.5.2.3 Option 3 – Conveyance of North Transportation Corridor and Hungryman Creek Port Area

Phase 1 – Planning Phase Activities

Under Option 3, the north transportation corridor easement would cross High Probability Area 1 at the summit of Bear Pass. Results of the desktop review indicate no previously documented cultural resources in this area. In 2023, the north transportation corridor (up to the point of connection with the south transportation corridor) and the Hungryman Creek port easement area were subject to a reconnaissance-level helicopter survey for cultural resources; however, a pedestrian survey was not completed due to dense trees and bear activity. The northernmost tip of the Hungryman Creek port easement area, near the mouth of Hungryman Creek, was identified as having high potential for prehistoric, protohistoric, and historic settlement and may contain unidentified cultural resources (Schwaderer 2024).

Impacts from geotechnical borings and any associated subsurface disturbance would be the same as that under Option 2.

Phases 2 and 3 – Construction and O&M

As with Options 2, the duration, extent, and severity of potential impacts for all options related to Construction and O&M activities cannot be accurately estimated at this time due to the absence of engineering plans.

Construction and O&M activities (Table 1-2) may impact as-yet-unidentified cultural resources, specifically in the northernmost section of the north transportation corridor near the mouth of Hungryman Creek and at the summit of Bear Pass. Construction and O&M have the potential to disturb archeological resources due to ground-disturbing activities including excavation, blasting, and construction. Impacts to resources would need to be avoided, minimized, or mitigated as part of the Section 106 consultation process prior to construction. An inadvertent discovery plan will be included as part of the Section 106 programmatic agreement and implemented by CIRC in consultation with NPS to avoid, minimize, and mitigate impacts during Construction and O&M.

Though the port area under Option 3 is the furthest away from the Snug Harbor Packing Company historic district, Construction and O&M still have the potential for visual impacts. Visual, auditory, and atmospheric impacts from Construction and O&M to the setting and feeling of the Snug Harbor Packing Company historic district would be estimated once plans and details are available and, if appropriate, mitigation measures developed to minimize impacts.

Additional Impacts from Planned Actions

Additional impacts from planned actions to cultural resources would be the same as those described for Option 2.

Option 4 – Conveyance of South Transportation Corridor and Deep Water Port Area

Phase 1 – Planning Phase Activities

Under Option 4, the south transportation corridor easement area would cross High Probability Area 1 at the summit of Bear Pass. In 2023, archeologists conducted a pedestrian reconnaissance survey of five cabins with associated outbuildings and one cultural depression within High Probability Area 2, which is located in the Deep Water port area easement. Two of the five cabins can be preliminarily dated to 50 years of age or older, making them potentially eligible for listing on the NRHP. High Probability Area 2 is considered an area of high probability to contain prehistoric, protohistoric, and historic cultural resources (Schwaderer 2024).

Impacts from geotechnical borings and any associated subsurface disturbance would be the same as that under Options 2 and 3.

Phases 2 and 3 – Construction and O&M

As with Options 2 and 3, the duration, extent, and severity of potential impacts for all options related to Construction and O&M activities cannot be accurately estimated at this time due to the absence of engineering plans.

Construction and O&M activities (Table 1-2) may impact existing and as-yet-unidentified cultural resources, specifically in the Deep Water port area easement and north of Bear Pass within the south transportation corridor area. Construction and O&M have the potential to disturb archeological resources and could diminish site integrity of previously identified cultural resources. Additionally, there is potential to impact the four previously identified historic properties in the Deep Water port area easement. Impacts would need to be avoided, minimized, or mitigated as part of the Section 106 consultation process prior to Construction. An inadvertent discovery plan will be included as part of the Section 106 programmatic agreement and implemented by CIRC in consultation with NPS to avoid, minimize, and mitigate impacts during Construction and O&M.

Construction and O&M have the potential to impact the Snug Harbor Packing Company historic district, located on Chisik Island outside of the Project area. Given the proximity of the port easement area under Option 4 (directly across from the historic district), there would likely be visual impacts on the Snug Harbor Packing Company historic district. Impacts from the Project to the setting and feeling of the Snug Harbor Packing Company historic district should be estimated once plans and details for Phases 2 and 3 are available and, if appropriate, mitigation measures developed to minimize impacts.

Option 4 has the potential to impact the Snug Harbor Packing Company historic district, located on Chisik Island outside of the Project area. Option 4 would likely have auditory, visual, or atmospheric impacts on the setting and feeling of Snug Harbor Packing Company historic district. Visual, auditory, and atmospheric impacts from Construction and O&M to the setting and feeling of the Snug Harbor Packing Company historic district would be estimated once plans and details are available and, if appropriate, mitigation measures developed to minimize impacts.

Additional Impacts from Planned Actions

Additional impacts from planned actions to cultural resources would be the same as those described for Option 2.

3.5.2.4 Comparative Conclusion of Options

Under Options 2 and 3, the Project area would overlap with the mouth of Hungryman Creek, an area identified as having high potential for the presence of prehistoric, protohistoric, and historic cultural resources. The area may contain as-yet unidentified cultural resources, and Project activities may adversely impact cultural resources.

Under Options 2, 3, and 4, the Project area would overlap with a previously identified High Probability Area at the summit of Bear Pass and may adversely impact as-yet unidentified cultural resources.

Options 2, 3, and 4, have the potential to impact the NRHP-listed Snug Harbor Packing Company historic district (also known as the Snug Harbor Cannery), located on Chisik Island outside of the Project area. Due to proximity to the Snug Harbor Packing Company historic district, Options 2 and 4 may have greater auditory, visual, or atmospheric impact to the setting and feeling of the historic district, while Option 3 may have less impact.

Options 3 and 4, would overlap with five previously identified structures and one cultural depression, specifically in the southern port area easement, and could diminish site integrity of these previously identified cultural resources. The area may also contain unidentified cultural resources, and Project activities may adversely impact as-yet-unidentified cultural resources.

3.6 SPECIAL STATUS SPECIES

3.6.1 Current and Expected Future Conditions of the Environment

Special status wildlife species include species designated as endangered, threatened, or candidate species; their designated critical habitat by USFWS or NMFS under the ESA (16 U.S.C. § 1531 et seq.); and federally listed species that are also protected by the Marine Mammal Protection Act of 1972 (16 U.S.C. § 1361 et seq.). Those species that would be protected under other federal laws (such as the Bald and Golden Eagle Protection Act, Migratory Bird Treaty Act) are discussed in Section 3.4.

Construction and O&M of the easement areas (both port and transportation areas) would require additional environmental review and likely permitting. For instance, should the Project impact jurisdictional waters (for example, through stream crossings or development within wetlands), a Clean Water Act Section 404 permit from the U.S. Army Corps of Engineers may be required, which in turn would require Section 7 consultation under the ESA with NMFS/USFWS for potential impacts to listed species. The analysis below is not intended to replace these environmental reviews.

ESA-listed wildlife species and their designated critical habitat potentially occurring in the vicinity of the proposed easements were determined based on information from NMFS (2024) and USFWS (2024). No ESA-listed species or designated critical habitats are known to occur within the transportation or port easements; however, several ESA-listed species and designated critical habitats are known to occur in the marine waters adjacent to the port easement area and are discussed below. Table 3-2 provides a summary of ESA-listed species and designated critical habitats that may occur in the vicinity of the proposed easements. Designated critical habitat for northern sea otter and Cook Inlet beluga whale within the Project vicinity is depicted on Figure 3-2.

Table 3-2. ESA-Listed Species Indicated as Potentially Occurring in the Vicinity of Proposed Easements

Common Name Scientific Name DPS	ESA Status and Listing Document	Critical Habitat Occurrence in Vicinity of Easement Locations
Sunflower sea star <i>Pycnopodia helianthoides</i>	Proposed Threatened 88 FR 16212	Critical habitat has not been designated for this species.
Steller's Eider <i>Polysticta stelleri</i>	Threatened 62 FR 31748	Not designated in the vicinity of the proposed easements.
Beluga Whale <i>Delphinapterus leucas</i> Cook Inlet DPS	Endangered 73 FR 62919	Critical habitat for this species includes "all marine waters of Cook Inlet" ... "including waters within 2 nautical miles seaward of MHW along the western shoreline of Cook Inlet between 60°15.0' N. and the mouth of the Douglas River (59°04.0' N., 153°46.0' W.)" and is present in the vicinity of the proposed easement locations (76 FR 20180).
Steller's Sea Lion <i>Eumetopias jubatus</i> Western DPS	Endangered 62 FR 24345	Not designated in the vicinity of the proposed easements.
Northern Sea Otter <i>Enhydra lutris</i> Southwest Alaska DPS	Threatened 70 FR 46366	Critical habitat for this species includes "all contiguous waters from the mean high tide line to the 20-m (65.6-ft) depth contour" and is present in the vicinity of the proposed easement locations (74 FR 51988).

Key: DPS = Distinct Population Segment; ESA = Endangered Species Act of 1973; FR = Federal Register

3.6.1.1 Sunflower Sea Star

Sunflower sea stars are found in intertidal and subtidal coastal waters along the Pacific Coast from the Aleutian Islands to Baja California (Lowry et al. 2022). Sunflower sea stars occupy a wide range of habitats and benthic substrates but tend to prefer kelp forests, eelgrass meadows, and rocky intertidal shoals. Sunflower sea stars also occur in benthic substrates composed of mud, sand, shell, gravel, and rocky bottoms (NMFS 2023b). They are most common at depths of less than 25 meters (82 feet) but may occur at depths up to 435 meters (1,427 feet) (Lowry et al. 2022). Park site-specific information for the species is lacking, but it appears that the species was common in the Gulf of Alaska, including at Katmai National Park and Preserve south of the Park. However, the Katmai National Park and Preserve population has declined 87 percent following sea star wasting (Gravem et al. 2021; Traiger et al. 2022). The species has a potential to occur in the nearshore marine environment at the port area.

Sunflower sea stars are susceptible to sea star wasting syndrome, which between 2013 and 2017 killed over 90 percent of sunflower sea stars throughout their range, with the highest declines occurring in waters south of the Washington state outer coast (Lowry et al. 2022; NMFS 2023a). The pathogen that causes the syndrome is currently unknown; however, outbreaks appear to be linked to environmental stressors such as rapid changes in water temperature, pollution, and other physical and chemical stressors. NMFS held public hearings on the proposed rule in May 2023 and is expected to make a listing decision in 2024 (88 FR 21600).

3.6.1.2 Steller's Eider

Steller's eiders breed in Arctic and subarctic Alaska, but molt and overwinter in the coastal waters of southwest Alaska, including within marine waters in the general vicinity of the proposed port area easement (Larned 2006). No critical habitat for Steller's eider occurs in Cook Inlet and during winter, the federally listed Alaska-breeding population mixes with the non-listed Russian-breeding population in Cook Inlet. Therefore, Steller's eiders in Cook Inlet are a mix of both breeding populations.

Steller's eiders have historically been rare in the marine waters of Tuxedni Channel, likely due to the abundance of sea ice that is present when the birds would normally be overwintering in Cook Inlet. For instance, only one Steller's eider was recorded in Tuxedni Bay during 2 years of aerial surveys (2004 and 2005), and only 14 birds were recorded in that same time north of Iniskin Bay (Larned 2006). This aligns with historical observations, where Steller's eiders were not documented in Tuxedni or Chinitna Bays during aerial surveys in 1994–1996 (Larned 2006). Steller's eiders prefer to winter in nearshore shallow coastal waters near rocky shoals, which are absent opposite the port area easement. However, changing sea ice conditions may provide suitable habitat to Steller's eiders during the winter.

3.6.1.3 Cook Inlet Beluga Whale

As much as 20 percent of the Cook Inlet distinct population segment of beluga whales may use the Park's coastline (Bennett 1996), especially in Tuxedni Bay and Tuxedni River (Castellote et al. 2024). As of 2023, scientists estimate the current population size is between 290 and 386, with a median best estimate of 331 beluga whales (NOAA 2023). In 2021–2022, researchers deployed underwater acoustic monitoring instruments (low-profile moorings and silos) in Tuxedni Bay and River, and Chinitna Bay and River. The acoustic monitoring devices were maintained to establish a sampling period from September 2021 to September 2022 (Castellote et al. 2024). Beluga whales were documented occurring in the area throughout the year but were primarily detected in Tuxedni Bay and Tuxedni River from September through April (Castellote et al. 2024). It is likely that the Park's coastline attracts beluga whales to the area through the

abundance of forage species (such as salmon, herring) present in the area (Bennett 1996; Castellote et al. 2024). Consequently, the Tuxedni Bay area is an important fall and winter foraging area, and no other winter foraging area has been described yet for Cook Inlet beluga whales (Castellote et al. 2024).

Another consideration is that the underwater acoustic environments of Tuxedni and Chinitna Bays (and the Park's coastline in general) are "among the quietest and most pristine soundscapes of all the quantified locations in Cook Inlet." Over 1 year of acoustic sampling, anthropogenic disturbance was not detected 86 percent of the time in Tuxedni Bay (Castellote et al. 2024). Hence the bay is relatively undisturbed by anthropogenic sources of underwater noise, and this is potentially why Cook Inlet beluga whales appear to use this area, especially during the winter months. Despite this, Castellote et al. (2024) concluded that beluga whales were likely negatively impacted by even the relatively minor amount of anthropogenic noise (largely produced by commercial ship traffic, onboard ship generators, and outboard motors) occurring in the area. Negative impacts can include masked hearing and reduced communication space, or decreased ability to passively listen for acoustic cues (specifically, prey or predator signals) (Castellote et al. 2024). Given that no other area in Cook Inlet has been identified as an important winter foraging area, the area is remarkably quiet compared to the rest of Cook Inlet, and considering the low population of Cook Inlet beluga whales, the current conditions of Tuxedni Bay are considered critical for the conservation and recovery of beluga whales in Cook Inlet.

Tuxedni Bay falls within Designated Critical Habitat Area 2 where beluga whales occur during the fall and winter (Figure 3-2). Area 2 includes the nearshore areas along the west side of Cook Inlet and Kachemak Bay on the east side of Lower Cook Inlet. In the Final Rule (76 FR 20180), published in 2011, NMFS identified five primary constituent elements (PCEs; also known as physical or biological features) essential for conservation of the species and that require special management considerations or protection. They are:

- PCE #1 – Intertidal and subtidal waters of Cook Inlet with depths less than 30 feet (9.1 meters) (Mean Lower Low Water) and within 5 miles (8 kilometers) of high and medium flow anadromous fish streams
- PCE #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
- PCE #3 – The absence of toxins or other agents of a type or amount harmful to Cook Inlet beluga whales
- PCE #4 – Unrestricted passage within or between the critical habitat areas
- PCE #5 – Absence of in-water noise at levels resulting in the abandonment of habitat by Cook Inlet beluga whales

The marine waters adjacent to the port area easements contain all the aforementioned PCEs. Bear Creek and the Johnson River both support primary prey species of the Cook Inlet beluga whale, Tuxedni Channel is generally free of toxins of a type or amount that would be harmful, and the area has been identified as possessing remarkably quiet waters in comparison to the rest of Cook Inlet. While the critical habitat mapping on Figure 3-2 shows the Cook Inlet beluga whale critical habitat slightly overlapping with the port area easements, the critical habitat mapping is imprecise as it follows the shoreline. In actuality, the port easements extend up to the

mean high tide line, which is also the extent of the critical habitat mapping and therefore the two layers are meant to be adjacent, but not overlapping.

3.6.1.4 Steller's Sea Lion

Steller's sea lions are regularly sighted moving through Tuxedni Bay in the spring, but do not appear to haul out in the area (Bennett 1996), indicating that Tuxedni Bay is likely not a high-use area for the species. There are no known haul outs within Tuxedni Bay, and the closest critical habitat is located at the mouth of Cook Inlet (NMFS 2024). Additionally, a mark-recapture study of Steller's sea lions throughout their distribution in Alaska (including both the eastern and western distinct population segments) did not document a significant use of this area in Cook Inlet by the species (Jemison et al. 2018).

3.6.1.5 Northern Sea Otter

Sea otters that reside along the west side of Cook Inlet (including the Lake Clark coastline) to the end of the Aleutian chain are part of the ESA-listed (threatened) southwest stock of northern sea otters. Listing occurred when data indicated the stock had declined over 90 percent in the 1990s (Doroff et al. 2003). With this listing, USFWS designated "15,164 km² (5,855 mi²) of nearshore waters ranging from the mean high tide line seaward for a distance of 100 m or to a water depth of 20 m (65.6 ft)" as critical habitat for the southwest stock critical habitat for northern sea otters (74 FR 51988). Due to the large spatial extent of the stock, USFWS designated several management units within the southwest stock boundary. The Park coastline is part of the Kodiak, Kamishak, Alaska Peninsula management unit. The Kodiak, Kamishak and Alaska Peninsula management unit is considered to be stable or slightly increasing with an estimated 30,658 sea otters (USFWS 2023). However, along the Park's shoreline, northern sea otter observations indicate low abundance (Garlich-Miller et al. 2018). This is likely due to sea otters still expanding and recolonizing areas where they once were hunted to near extinction during the Fur Harvest (1700s to the early 1900s). For example, during surveys conducted from 1994–1996, only one sea otter was observed along the Park's coastline, although they were apparently abundant south of Chinitna Point (Bennett 1996). Surveys conducted in 2017 indicated that, while up to eight otters per square kilometer were observed within Kamishak Bay, otter densities were relatively low north of the bay (USFWS 2018). Additionally, NPS has participated in collaborative surveys for northern sea otters using transect survey methods along the Park coastline, and data are available for surveys conducted in June 2019, August 2023, and April and June of 2024 (NPS unpublished data, n.d.-f). These data indicate that observations of northern sea otters (a sighting of one or more northern sea otters) were made 33 times along the Park's coastline during these transect surveys, with only five of the observations occurring north of Spring Point (NPS unpublished data, n.d.-f). Consequently, while northern sea otters do not appear to be abundant in the easement area, there is potential that they may occur regularly in the vicinity of the proposed port easements. It should be noted that little can be said about winter distribution of northern sea otters in the area.

The entire range of the southwest stock of northern sea otters was designated as critical habitat. Within the Project vicinity, critical habitat occurs along the western edge of Cook Inlet and around Chisik Island, as depicted on Figure 3-2. While the critical habitat mapping on Figure 3-2 shows the northern sea otter critical habitat slightly overlapping with the port area easements, the critical habitat mapping is coarse as it follows the shoreline. In actuality, the port easements extend out to the mean high tide line, which is also the extent of the critical habitat mapping and therefore the two layers are meant to be adjacent, but not overlapping.

Critical habitat is based on four PCEs:

- PCE #1 - Shallow (<6.6 feet [2 meters] deep), rocky areas where marine predators are less likely to forage.
- PCE #2 - Nearshore (within 328.1 feet [100 meters] of the high-water mark) waters that might provide protection or escape from marine predators.
- PCE #3 - Kelp forests that provide protection from marine predators (waters <65.6 feet [20 meters] deep).
- PCE #4 - Prey resources within the areas identified by PCEs 1, 2, and 3 that are present in sufficient quantity and quality to support the energetic requirements of the species.

Much of the area immediately adjacent to the port easement locations are classified as mudflats (Bennett 1996) and would be unlikely to support shallow rocky areas that could provide shelter from predators. However, as otters have been occasionally observed in the vicinity of the Park's coastline, suitable habitat for the species may occur further into Tuxedni Channel.

3.6.1.6 Additional Trends and Planned Actions

As part of the Cook Inlet Planning Area Oil and Gas Lease Sale 258 (which took place December 30, 2022), there is potential for oil and gas exploration and development in Cook Inlet; however, a July 2024 judicial ruling suspended the lease sale (U.S. District Court of Alaska Case No. 3:22-cv-00279-SLG). It is unclear if the lease sale will be permitted at this time.

On July 18, 2024, Conservation for Biological Diversity and Cook Inlet Keeper petitioned NMFS to establish a Cook Inlet Beluga Protection Zone in the Tuxedni Bay of Alaska (Center for Biological Diversity and Cook Inlet Keeper 2024). Currently, it is unknown to NPS if NMFS will create a Beluga Protection Zone in the Tuxedni Bay, so it will not be considered further in this RA. More information about this petition can be found at: <https://www.biologicaldiversity.org/>.

As described in Section 3.4.1.4, a changing climate has increased temperatures across Alaska in recent years (Ballinger et al. 2023). This can cause a plethora of changes to the marine environment which may change the current and expected future conditions of habitat for special status species. Climate change-driven ocean acidification, marine heat waves, reduced sea ice coverage, and altered prey availability have the potential to influence the recovery and long-term persistence of special status species within Cook Inlet. Environmental stressors from climate change and potential Construction and O&M impacts of the Project may cumulatively increase the overall stress on special status species.

There are no plans for other management changes or additional planned actions in the proximity of the Project that would impact special status species. The Park and the surrounding areas would continue to be managed in ways similar to current conditions.

3.6.2 Environmental Consequences

3.6.2.1 Option 1 – No Action

Impacts of Option 1

Under Option 1, the easements would not be conveyed for either a port or a transportation route and the conditions of ANCSA and the 1976 Act would not be fulfilled. As a result, impacts to special status species would be the same as described above, in the “Current and Expected Future Conditions of the Environment.”

Additional Impacts from Planned Actions

Under Option 1, an easement would not be conveyed and there would be no impacts to special status species; therefore, the environment would remain the same as or similar to the “Current and Expected Future Conditions of the Environment” section. Past, present, and reasonably foreseeable actions and their impacts would be the same as those described in the “Current and Expected Future Conditions of the Environment” section.

3.6.2.2 Option 2 – CIRI’s Initial Proposal

Phase 1 – Planning Phase Activities

There are five federally listed species with potential to occur in the nearshore marine environment adjacent to the proposed port area. The sunflower sea star is a proposed threatened species and its current status within Tuxedni Channel is unknown. The species has the potential to occur in the marine waters; however, their density and distribution is unknown. The majority of benthic substrate around the port easements is mudflats, which is a less preferable benthic substrate for the species. Furthermore, the port easements do not extend beyond the mean high tide line, and therefore, sunflower sea stars would not be located directly within the port easements. Impacts are unlikely to occur to this species during planning phase due to the port area being above mean high tide and because of lack of preferred habitat.

Both Steller’s eider and Steller’s sea lions may occur in Tuxedni Channel, but infrequently and in low numbers. Neither species is regularly detected in the area, and both species are more common farther south in lower Cook Inlet where rocky shoals and outcrops are more prevalent. Aerial surveys (Larned 2006) indicated low numbers of Steller’s eider within Tuxedni Channel. Since the channel has a large percentage of mud flats, which are not a preferred molting or winter foraging area for Steller’s eider, the likelihood of Steller’s eider using Tuxedni Channel for extended periods of time in the winter is unlikely. Steller’s eider prefer to molt and winter in protected nearshore marine waters with rocky shoals which are lacking around the port area. Of the federally listed species indicated as potentially present near the easement locations (see Section 3.6.1), only Cook Inlet beluga whales and northern sea otter may regularly occur there. Cook Inlet beluga whales feed and overwinter in Tuxedni Bay (Bennett 1996; Castellote et al. 2024), and northern sea otters are known to occur along the shorelines of the Park, albeit typically farther to the south than the easement areas (Bennett 1996; NPS unpublished data, n.d.-f).

Under Option 2, the full port easement area would subject to the easement conveyed, exposing more coastline to development from an increase in acreage, and less restrictive CIRI Terms and Conditions resulting in increased potential for mortality. There are no Planning Phase CIRI Terms and Conditions for Option 2 that protect special status species (apart from nesting federally listed birds, none of which occur within the Project vicinity). The lack of Terms and Conditions that protect special status species leaves special status species vulnerable to take. Specifically, airborne or underwater noise generated by helicopters or vessels would not be limited during the Planning Phase and may result in take and adverse impacts to Cook Inlet beluga whales and northern sea otters if present in the area. The CIRI Terms and Conditions that are applicable to Option 2 do not contain underwater decibel limits or restrictions on vessels, helicopters, and aircraft. Additional discussion of potential Project impacts to the two species most likely to occur adjacent to the port area (Cook Inlet beluga whale and northern sea otter) are discussed below.

Cook Inlet Beluga Whale

Impacts to Cook Inlet beluga whale may occur during Planning Phase studies necessary to design, engineer, and permit the Project. Generally, these are limited to pedestrian engineering surveys, geotechnical drilling, hydrology and hydraulics analysis, environmental and cultural surveys, and helicopter and helipad clearing. Since the area has no roads, helicopters will be used during Planning Phase activities to transport surveyors and supplies to the easement areas. Airborne noise generated by helicopters may disturb beluga whales in marine areas adjacent to the easement locations. Whales that are disturbed by helicopters may leave the area or alter their behavior in response to the presence of aircraft and anthropogenic in-air noise. This could result in decreased foraging efficiency, increased energy expenditure, or other adverse effects. If boats are used to access the easements for Planning Phase surveys, there is a potential for underwater noise to disturb beluga whales or result in the acoustic masking issues described in Section 3.6.1.3. There is also the possibility of injury and mortality from vessel strike. Lastly, there are no CIRI Terms and Conditions that offer protection or reduction of potential impacts for Cook Inlet beluga whale.

There is a small potential for limited impacts to designated critical habitat for Cook Inlet beluga whales resulting from Planning Phase activities. This could include impacts from increased noise through the use of boats to access the Park's coastline. However, the Planning Phase impacts are anticipated to be temporary and return to baseline relatively quickly.

Northern Sea Otter

Northern sea otters are currently uncommon in Tuxedni Bay and Tuxedni Channel (Bennett 1996). Surveys conducted in 2017 indicated that, while up to eight northern sea otters per square kilometer were observed within Kamishak Bay, northern sea otter densities were relatively low north of the bay (USFWS 2018). NPS transect surveys of the coastline also resulted in few observations of northern sea otters north of Spring Point near Chinitna Bay (NPS unpublished data, n.d.-f). Consequently, while the species may regularly occur in the area, they are not anticipated to occur in large numbers near the port area easements. However, individual northern sea otters may still be impacted by the Project.

Northern sea otters are most likely to be exposed to Project activities in marine environments. Consequently, Planning Phase activities (largely limited to pedestrian surveys and terrestrial sampling techniques) are unlikely to impact individual northern sea otters. However, helicopters and vessels may be used during Planning Phase activities to transport surveyors and supplies to the easement areas. Airborne and underwater noise may disturb northern sea otters in marine areas adjacent to the easement locations. Additionally, young northern sea otter pups are unable to swim well or forage on their own, and mortality could occur if adults abandon very young pups as a result of disturbance from Planning Phase activities. Lastly, there are no CIRI Terms and Conditions that offer protection or reduction of potential impacts for northern sea otter.

Impacts to northern sea otter critical habitat from Planning Phase activities are unlikely. Shallow, rocky marine areas are unlikely to occur in any of the proposed easement locations (PCE #1), Planning Phase activities are unlikely to inhibit the species' ability to utilize nearshore waters to escape predators (PCE #2), no kelp forests are known in the area of proposed easements (PCE #3), and Planning Phase activities are unlikely to impact benthic prey resources for the species. Consequently, it is unlikely that Planning Phase activities would impact designated critical habitat for the northern sea otter.

Phases 2 and 3 – Construction and O&M

Of the federally listed species potentially present near the easement locations (see Section 3.6.1), the Cook Inlet beluga whale and northern sea otter are most likely to occur in the nearshore marine waters adjacent to the port area. However, potential exists for impacts to the sunflower sea star as a result of Construction and O&M of a port.

Impacts to these species are likely from the Construction and O&M of a port and the road/rail. While specific details regarding the anticipated road/rail and port and are not known, it is likely that both Cook Inlet beluga whales and northern sea otters would be impacted by the increase in anthropogenic disturbance in the area. This could be from the increase in vessel operation in the area (increased human presence, increased underwater and airborne noise, and potential for injury and mortality from vessel strike), through disruption of forage species, and from accidental oil and other hazardous material spills.

Construction and O&M of a road/rail and port would likely require additional environmental review and permitting, including compliance with the ESA, the Magnuson–Stevens Fishery Conservation and Management Act (for Essential Fish Habitat assessment) and Marine Mammal Protect Act, once the scope and design for these actions are sufficiently developed. Terms and Conditions would be determined in coordination with NMFS and USFWS at this time. Furthermore, the Terms and Conditions would take into account any changes in ESA listing, delisting, and downlisting of species and/or their critical habitats in both terrestrial and aquatic areas.

Cook Inlet Beluga Whales

Tuxedni Bay and the surrounding areas represent an important over-wintering area for the Cook Inlet beluga whale (Castellote et al. 2024). This is due to the quiet waters found in Tuxedni Bay, which are largely free of anthropogenic disturbance (Castellote et al. 2024). As a component of the port area easement, it is anticipated that a port would be constructed to facilitate the transport of mined materials and supplies in and out of the Johnson Tract. While specific details regarding the port's design are unknown, port construction would substantially increase the amount of anthropogenic disturbance in the region. The physical presence of vessels during port Construction and O&M may temporarily displace Cook Inlet beluga whales and cause them to avoid the area. Underwater noise from vessels and during port construction (with noise levels varying based on the port design and construction techniques) would need to be assessed to determine if they exceed acoustic harassment thresholds. Anthropogenic noise can affect the species' ability to communicate and passively listen for acoustic cues (specifically, prey or predator signals). This could reduce the species' ability to effectively forage, avoid predators, or communicate with one another in the vicinity of the port and/or vessels calling at the port. This increase in noise would be related to both an increase in vessel traffic and operation of an industrial port and would represent a long-term increase in ambient underwater noise. Consequently, the development of the port area easement would reduce the habitat quality of Tuxedni Bay for beluga whales, impacting an area previously identified as important for the conservation of the species.

Construction and O&M of the port would increase the concentration of vessel traffic around the port (Rodrigue and Slack 2024) thereby increasing the potential for vessel collisions with Cook Inlet beluga whales. Depending on the port location, a road along the shoreline (for the Deep Water port easement) may be required if the port is placed in deeper water near the mouth of Tuxedni Channel. This may necessitate blasting and fill into nearshore waters to accommodate an access road, which may result in habitat loss and disturbance. Finally, the

potential for accidental spills of hazardous materials (such as fuel, oil, blasting and other mining compounds) may impact Cook Inlet beluga whales and their prey species.

Since Cook Inlet beluga whale designated critical habitat occurs immediately adjacent to the proposed port area easement locations, there is potential that the Construction and O&M of the transportation corridor(s) and port areas could impact designated critical habitat. As specific details pertaining to Construction and O&M Phases are not known, potential impacts to critical habitat are discussed below in general terms based on anticipated impacts to PCEs:

- **PCE #1:** This PCE recognizes the importance of anadromous fish streams to Cook Inlet beluga whales. Both Bear Creek and Johnson River support anadromous fish, contributing to the availability of prey. Chum and pink salmon were observed spawning in Bear Creek in late September (ADFG 2024b), which coincides with the return of Cook Inlet beluga whales to the Tuxedni area and when foraging behavior was documented (Castellote et al. 2024). Consequently, any impacts to freshwater aquatic resources resulting from Phases 2 and 3, including impacts to salmon (as described in Section 3.3), would also impact Cook Inlet beluga whale critical habitat.
- **PCE #2:** This PCE incorporates the primary prey species of Cook Inlet beluga whales and impacts to salmon or other forage species from the Construction and O&M of the transportation corridor (the potential introduction of fish barriers, for instance) or port area (loss of benthic habitat from the creation of permanent structures, for instance) could also impact Cook Inlet beluga whale critical habitat.
- **PCE #3:** This PCE recognizes the importance of water absent of toxins or other pollutants for Cook Inlet beluga whales. Construction and O&M activities could introduce toxins to marine environments through spills of fuel, oil, oil products, mined material, or other industrial substances, and thereby impact designated critical habitat.
- **PCE #4:** Unrestricted passage is important for Cook Inlet beluga whales to move between different habitat areas. Development of the port area could impact habitat connectivity through an increase in vessel traffic and the presence of a physical port structure within critical habitat. Vessel activity could reduce the ability of Cook Inlet beluga whales to access resources in the area (through behavioral avoidance of the area). This may be particularly important in the winter months, when Cook Inlet beluga whales are more frequently detected in the area.
- **PCE #5:** Increased underwater noise has the potential to impact Cook Inlet beluga whales by masking hearing and reducing communication space, or decreasing their ability to passively listen for acoustic cues (i.e., prey or predator signals) (Castellote et al. 2024). While the amount of underwater noise potentially created by a developed port area is not known (because specifics about the port's design are unknown), there is potential that the underwater noise associated with an industrial port could impair the viability of the Tuxedni area as a critical winter foraging refuge.

Northern Sea Otter

As a component of the port area easement, it is anticipated that a port would be constructed to facilitate the transport of mined materials and supplies in and out of the area. Consequently, northern sea otters may be subject to many of the same potential effects as those described previously for Cook Inlet beluga whales, which includes increased anthropogenic disturbances in the area (such as Construction and O&M of the port, increased vessel traffic), increased potential for spills, increased potential for injury and mortality, and increased airborne and underwater noise. This could inhibit the species' ability to forage and/or detect predators. In

addition, northern sea otters are benthic foragers, so disturbance to the marine substrate from port construction may impact prey resources.

Northern sea otter designated critical habitat may be impacted by Construction and O&M of the port area, since it occurs immediately adjacent to the proposed port area easement locations. Since specific details pertaining to phases 2 and 3 are not known, potential impacts to critical habitat are discussed below in general terms based on anticipated impacts to PCEs:

- PCE #1 – Shallow, rocky areas are unlikely to occur in the immediate vicinity of the port area, which is classified as a mudflat. Consequently, impacts to PCE #1 are unlikely from the Construction and O&M of the transportation corridor(s) and port areas.
- PCE #2 – Nearshore habitat that potentially provides protection from marine predators could be impacted by the Project. As development of a port area would necessarily remove habitat from Tuxedni Channel, some nearshore habitat would be lost directly, and indirectly by avoidance of habitat due to anthropogenic disturbance.
- PCE #3 – No kelp forests are known from within the port area easement location. Consequently, no impacts to PCE #3 are anticipated.

PCE #4 – As nearshore habitat occurs in the area (as described above for PCE #2), there is potential that prey resources for the species also occurs there. Northern sea otters are benthic foragers, and disturbance to the marine substrate from port Construction and O&M may negatively affect their prey species.

Additional Impacts from Planned Actions

The potential for additional impacts from planned actions to special status species is anticipated to be similar to potential additional impacts from planned actions to wildlife species described under Section 3.4.2.2.

Authorization for incidental take has recently been requested from NMFS for impacts to marine mammals resulting from oil and gas activities in Cook Inlet, including Cook Inlet beluga whales (89 FR 51121). The construction of a port area for the Project would also increase the amount of industrial activity, vessel operation, and shipping activities within Cook Inlet, and these effects would be additive to similar effects produced by oil and gas exploration.

3.6.2.3 Option 3 – Conveyance of North Transportation Corridor and Hungryman Creek Port Area

Phase 1 – Planning Phase Activities

Impacts under Option 3 to special status species and critical habitat are anticipated to be similar to those described under Option 2. The primary difference is that under Option 3, a smaller port area would be subject to the easement conveyed, potentially exposing less coastline to development, and more protective Terms and Conditions would apply. Specifically, airborne or underwater noise generated by helicopters or vessels would be limited during the Planning Phase, potentially reducing adverse impacts to Cook Inlet beluga whales and northern sea otters that are present in the area. The Terms and Conditions that are applicable to Option 3 also contain underwater decibel limits or restrictions on vessels, helicopters, and aircraft. The Terms and Conditions for Option 3 also restrict drilling when Cook Inlet beluga are present in nearby critical habitat (September 1 to May 15). Consequently, impacts to listed species and critical habitat from Planning Phase activities under Option 3 are anticipated to be less extensive than under Option 2.

Phases 2 and 3 – Construction and O&M

Similar to Option 2, Construction and O&M of Option 3 may adversely impact special status species and critical habitat. The notable difference is that the Hungryman Creek port area under Option 3 includes 264 acres compared to 1,307 acres in the port area included under Option 2. Consequently, Construction and O&M of the port area under Option 3 would expose much less area to potential development. Details about the Construction and O&M are unknown at this time but would likely result in substantial adverse impacts to special status species and their critical habitats within the marine environment at that time, albeit to a lesser degree than Option 2 (due to the smaller easement area).

The requirement to complete additional environmental review and permitting once the scope and design for Construction and O&M are known, including compliance with ESA, the Magnuson–Stevens Fishery Conservation and Management Act (for Essential Fish Habitat assessment) and Marine Mammal Protection Act, would be the same for Options 3 and 4.

Additional Impacts from Planned Actions

Additional impacts from planned actions to special status species from Option 3 would be the same as those described for Option 2.

3.6.2.4 Option 4 – Conveyance of South Transportation Corridor and Deep Water Port Area

Phase 1 – Planning Phase Activities

Impacts under Option 4 to special status species would be similar to Option 3 with the port area located further south closer to the mouth of Tuxedni Channel. Impacts to special status species are more likely to arise from the potential development of a port and the transportation road/rail rather than from the Planning Phase activities that are largely conducted as pedestrian surveys.

Phases 2 and 3 – Construction and O&M

Impacts would be the same as described previously for Option 3.

Additional Impacts from Planned Actions

Additional impacts from planned actions to special status species from Option 4 would be the same as those described previously for Option 3.

3.6.2.5 Comparative Conclusion of Options

Under Option 1, the easements would not be conveyed for either a port or a transportation route and there would be no impacts to special status species in the Project area.

Impacts to special status species and critical habitat could result from the Planning Phase actions necessary to design, engineer, and permit the Project. While the same Planning Phase activities would occur under Options 2, 3, and 4 (e.g., the number of boreholes and helicopter landing pads), the general locations of those activities would be different between the options. All options would include potential disturbance of special status species during Planning Phase activities, primarily as a result of helicopter and/or boat use to access the easement areas. Within the Project vicinity, special status species only occur in the nearshore marine environment within Tuxedni Channel. Option 2 would have the greatest adverse impacts during Planning Phase actions due to the less restrictive CIRC Terms and Conditions.

Options 2, 3, and 4 may result in impacts to special status species and critical habitat through the Construction and O&M of the port area and transportation corridor. Development of the port

would substantially increase the amount of anthropogenic disturbance in the region, including the generation of underwater noise, increased vessel traffic, potential for direct injury or mortality from collisions, and an increased risk of spills. This is especially important because currently there is low anthropogenic noise and activity during winter months when Cook Inlet beluga whales are present in the area. Tuxedni Bay and Channel are a winter refugia for Cook Inlet beluga whales where they are exposed to low levels of anthropogenic disturbance. During the summer months, when anthropogenic activity increases in the area, Cook Inlet beluga whales are generally absent from the Tuxedni area since they travel north into upper Cook Inlet. Therefore, the creation of a transportation corridor and port has the potential to substantially increase the level of anthropogenic disturbance to Cook Inlet beluga whales during the winter months, especially if the port is used year-round.

For all options, the duration, extent, and severity of potential impacts related to Construction and O&M activities cannot be accurately estimated at this time due to the absence of engineering plans. Since the special status species are marine based and do not appear to be concentrated closer to either the north or Deep Water port area, Options 3 and 4 do not differ in their impacts to special status species. Option 2 could result in potentially the greatest level of impacts depending on the final port size since the port easement is larger than either Options 3 or 4.

3.7 WATER QUALITY AND SURFACE WATER HYDROLOGY

3.7.1 Current and Expected Future Conditions of the Environment

The Project area is located in the Tuxedni-Kamishak Bays Alaska Subbasin (hydrologic unit code 19020602) (U.S. Geological Survey 2024a). Streams in this subbasin generally originate in high mountain areas and flow east a short distance before emptying into Cook Inlet. The two main drainages near the Project area are the Johnson River, which begins at the toe of Johnson Glacier and flows southeast through the Park to Cook Inlet, and Bear Creek, which has its headwaters at Bear Pass and flows northeast to the Tuxedni Channel (Figure 3-3). Hungryman Creek also drains a small segment of the proposed port area in the far northern corner of the easement.

Water quality and surface water hydrology data in the Project area are limited. From 1995 to 2004, the U.S. Geological Survey measured streamflow and collected water quality samples from the Johnson River above Lateral Glacier (U.S. Geological Survey station ID 15294700). A publication by Brabets and Riehle (2003) reviewed and summarized the data collected at this location through 2002. Between 2020 and 2023, JT Mining Inc. collected several water quality samples from the Johnson River, Bear Creek, Hungryman Creek, and other nearby streams. The monitoring locations sampled by the U.S. Geological Survey and JT Mining are shown on Figure 33. NPS also performed three rounds of field parameter data collection on the Johnson River between 2021 and 2023. The field parameters measured included stream temperature, dissolved oxygen, specific conductance, pH, and turbidity. Overall, the water quality datasets from the U.S. Geological Survey and JT Mining were considered the best available sources for characterizing site-specific water quality (and were the primary datasets used in this analysis) since the data spanned several different streams and contained results for a wider range of analytical parameters. However, the available data should not be considered representative of the full hydrologic or hydrochemical variability of the area.

Continuous discharge records for the Johnson River indicate that average daily discharge in the river ranges from 1.5 cubic feet per second to over 5,000 cubic feet per second (Brabets and Riehle 2003).

Peak flow typically occurs in late June or early July due to snowmelt. Later in the summer, the river is primarily sustained by ice melt from Johnson Glacier and Double Glacier. In the fall, heavy precipitation events may increase the river flow well above the average daily flow rate. One such event occurred in October 2003 when the peak flow measured was over 10,000 cubic feet per second (U.S. Geological Survey 2024b).

Average pH, turbidity, and major ion concentrations calculated from the U.S. Geological Survey and JT Mining datasets are summarized in Table 3-3. At each location, the average concentrations are based on data from between 1 and 18 water quality samples. The total dissolved solids content at the monitoring locations is low, with average total dissolved solids values around 100 milligrams per liter or less. Except for Hungryman Creek, where the turbidity is very low, the average turbidity readings for the sample locations range from 18 to 41 nephelometric turbidity units. These turbidity values may reflect the presence of suspended sediment from glacial meltwater. The pH in the water quality samples was generally neutral to slightly alkaline except in HC-02, but the average pH at this location is based on only one reading. Calcium is the dominant cation in the samples collected, and bicarbonate and sulfate are the dominant anions. The samples contain relatively little magnesium, potassium, sodium, and chloride. Several samples in the JT Mining dataset were found to exceed State of Alaska water quality standards for protection of aquatic life. The constituents exceeding standards include total aluminum, total iron, total lead, total mercury, and copper (Owl Ridge Natural Resource Consultants Inc. 2024).

3.7.1.1 Additional Trends and Planned Actions

Borehole drilling for mineral exploration occurred on the North and South parcels of the Johnson Tract between 1982 and 1995, with approximately 90 boreholes completed. Because these activities occurred almost 30 years ago, the pad areas used for drilling have likely been reclaimed to their native state. Any residual water quality effects from this legacy disturbance would be incorporated into the baseline water quality datasets for the area collected by the U.S. Geological Survey (1995 to 2004) and JT Mining (2020 to 2023).

As part of the Cook Inlet Planning Area Oil and Gas Lease Sale 258 (which took place December 30, 2022), there is potential for oil and gas exploration and development in Cook Inlet; however, a July 2024 judicial ruling suspended the lease sale (U.S. District Court of Alaska Case No. 3:22-cv-00279-SLG). Consequently, of the 193 tracts offered, only one lease was issued, which is located approximately 12 miles offshore from the southeast coast of the Park. If this lease were developed, crude oil spills or well blowouts could alter water quality in Cook Inlet and along adjacent shorelines. Although rare, these types of incidents can have widespread water quality consequences.

Climate change has resulted in increasing temperatures across all of Alaska over the past several decades (Ballinger et al. 2023). On the east side of the Park, the temperature has increased by approximately 0.3 degrees Celsius per decade between 1957 and 2021. During this same period, precipitation in this area has remained approximately the same or increased slightly. Assuming the trends of increasing temperature and consistent precipitation continue into the future, stream flows may decrease over the long term if glaciers feeding the Johnson River melt completely and evapotranspiration rates increase.

There are no additional trends, planned actions, or management changes that would impact water quality or surface water hydrology in the Project vicinity. The Park and surrounding areas will continue to be managed in ways similar to current conditions.

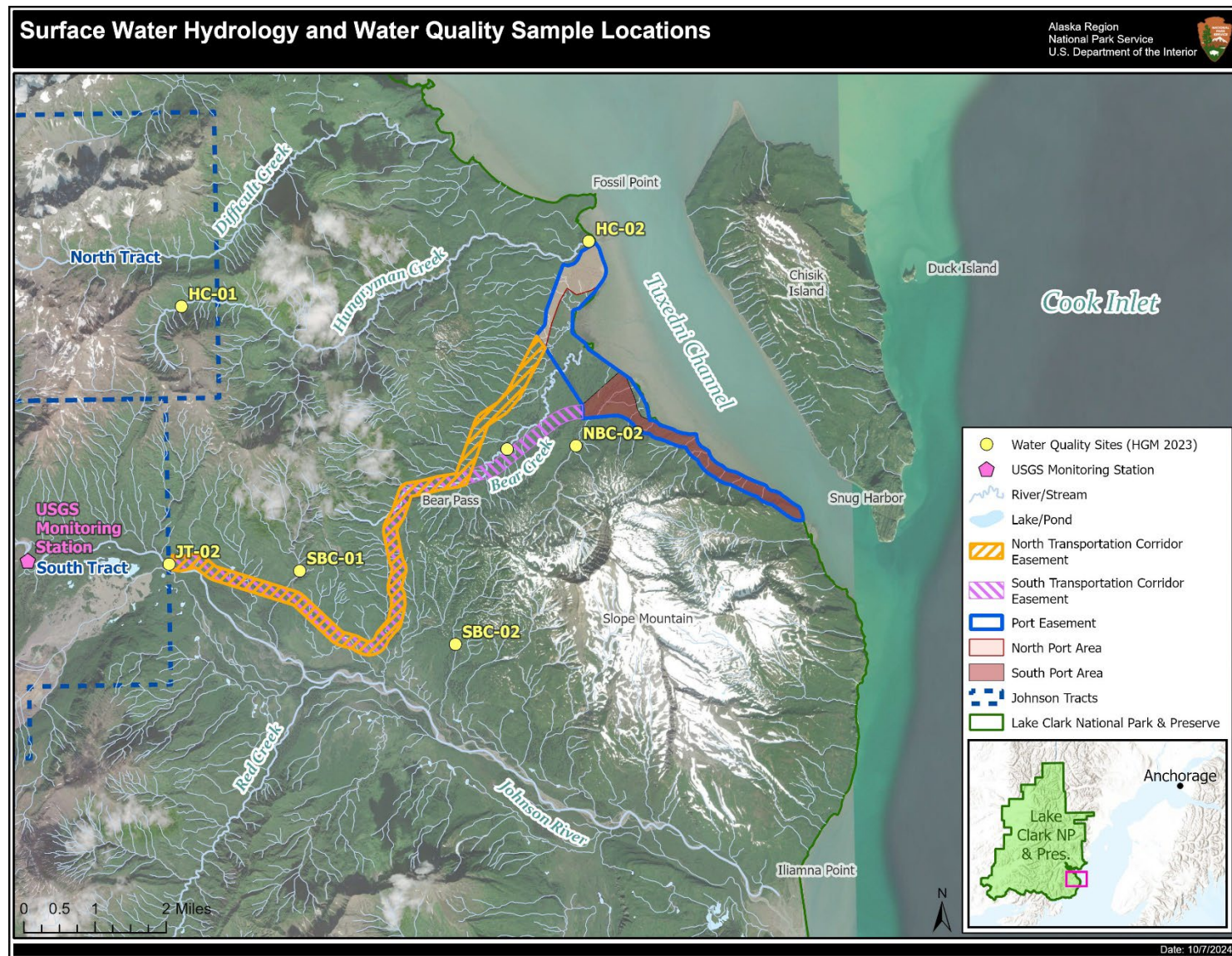


Figure 3-3. Surface Water Hydrology and Water Quality Sample Locations

Table 3-3. Average pH, Turbidity, and Major Ion Concentrations for Project Area Streams

Sample Station	Site Name	No. Samples	pH	Turbidity (NTU)	Calcium (mg/L)	Magnesium (mg/L)	Potassium (mg/L)	Sodium (mg/L)	Bicarbonate (mg/L)	Chloride (mg/L)	Sulfate (mg/L)	Total Dissolved Solids (mg/L)
HC-01	Hungryman Creek 01	11	7.4	0.7	16.6	0.9	0.1	1.4	23.8	0.3	19.7	62.3
HC-02	Hungryman Creek 02	1	6.1	0.6	24.8	1.9	0.1	2.4	35.5	0.7	33.8	81.0
NBC-01	N. Bear Creek 01	5	7.3	32.7	23.2	2.8	0.7	3.4	34.3	0.8	32.9	105.4
NBC-02	Little Bear Creek	5	7.5	31.2	19.7	2.3	0.5	4.4	19.6	0.9	30.7	93.4
SBC-01	Johnson River Tributary 01	5	7.7	18.5	25.2	2.5	0.5	3.3	35.9	0.6	36.0	104.4
SBC-02	Johnson River Tributary 02	3	8.2	24.6	23.0	2.4	0.3	2.3	No Data	No Data	34.9	103.0
JT-02	Johnson River 02	14	7.1	29.1	12.5	1.8	0.5	1.3	15.0	0.3	14.7	53.2
Station 15294700	Johnson River above Lateral Glacier	18	7.6	40.9	8.9	1.8	0.4	1.2	18.2	0.7	9.1	35.4

Key: mg/L = milligrams per liter; NTU = nephelometric turbidity units

All samples collected by JT Mining, Inc. between 2020 and 2023, except for Station 15294700, which was sampled by the U.S. Geological Survey from 1998 to 2004.

Source: JT Mining, Inc n.d., U.S. Geological Survey 2024b

3.7.2 Environmental Consequences

3.7.2.1 Option 1 – No Action

Impacts of Option 1

Under Option 1, the easements would not be conveyed for either a port or a transportation route and the conditions of ANCSA and the 1976 Act would not be fulfilled. As a result, impacts to water quality and surface water hydrology would be the same as described above, in the “Current and Expected Future Conditions of the Environment.”

Additional Impacts from Planned Actions

Under Option 1, an easement would not be conveyed and there would be no impacts to water quality and surface water hydrology; therefore, the environment would remain similar to the “Current and Expected Future Conditions of the Environment” and would only be subject to change from long-term climate trends. Past, present, and reasonably foreseeable actions and their impacts would be the same as those described in the “Current and Expected Future Conditions of the Environment” section.

3.7.2.2 Option 2 – CIRI’s Initial Proposal

Phase 1 – Planning Phase Activities

The Planning Phase activities most likely to affect water quality and surface water hydrology in the north and south transportation corridor easements and the full port area include constructing helipads and implementing a geotechnical investigation program. Vegetation removal for helipad construction would likely locally increase erosion around the helipad sites, potentially leading to downslope transport of eroded sediment that could be deposited in nearby waterbodies. The resulting sediment transport and deposition may affect water quality by increasing surface water turbidity and sediment loads. Impacts would be short-term and limited to the period between construction and successful reclamation of each helipad.

Any geotechnical investigation in the Option 2 easements would require a small, motorized drill rig. At each drilling location, a 20-by-20-foot wooden drilling platform may be constructed to distribute the weight of the rig over a larger area and to prevent compaction and rutting of the ground surface. Some vegetation clearing and grading could still be required at each drilling location to provide a level surface for the drill pad. The vegetation clearing and grading would have similar impacts to ground disturbance associated with helipad construction: erosion could temporarily increase from the disturbed areas, with the eroded sediment potentially transported downslope to nearby waterbodies.

During geotechnical drilling, water would be pumped from the nearest stream to mix drilling fluids for downhole use. The surface water withdrawals would lower stream flows and could affect the overall hydrology of the stream used as a water source.

The geotechnical drilling program would also require importing fuel via helicopter fly tanks ranging in capacity from 70 to 130 gallons. Upon delivery to the site, the tanks would be stored in secondary containment with double the capacity of the tank volume. Spill cleanup kits would be provided near each fuel storage location. These measures would help prevent water quality impacts from accidental fuel spills by containing the spill to a localized area and providing the means for prompt cleanup. Although less likely than a stationary spill, there is a small chance that fuel tanks could be dropped or damaged during aerial transport to on-site staging locations.

In such cases, the potential for water quality impacts would be greater since the spilled fuel could disperse over a wider area.

Option 2 includes fewer Terms and Conditions to protect water quality and hydrology relative to the other options. The less restrictive Terms and Conditions could result in a greater degree of brush clearing for helipads, more drill pads constructed in saturated soil areas, and more concentrated pumping from streams during low flow periods. The first two of these conditions would result in more intense localized erosion that may cause higher stream sediment loads compared to Options 3 and 4. Additionally, the more concentrated pumping from streams during low flow conditions could have a greater impact on stream flows and hydrology compared to the other Project options.

Phases 2 and 3 – Construction and O&M

Site-specific plans for Construction and O&M are not available, but the new road/rail would likely require at least one crossing of Bear Creek whether the north or south transportation corridor is used. Although the transportation corridor would be refined to a 250-foot easement during Construction, the disturbance area for the road/rail and port construction would still be larger and result in higher amounts of sediment erosion compared to Project Planning Phase activities. As such, water quality degradation from sediment deposition in adjacent streams could also be higher. If a new road is constructed in the transportation corridor (instead of a rail line) and the road surface is left in a natural state, strong storms in Cook Inlet and Tuxedni Bay would likely exacerbate erosion and necessitate regular road surface repairs. Specific best management practices and Terms and Conditions that would be implemented to mitigate erosion from the road surface and construction areas are not known at this time.

Additional Impacts from Planned Actions

Future offshore oil and gas development could occur as part of the Cook Inlet Planning Area Oil and Gas Lease Sale 258. Since surface water in the Project area ultimately drains to Cook Inlet, any water quality degradation from the Project could combine with effects from future offshore oil and gas activity to locally alter water quality in the inlet. Additionally, building a new port area on Tuxedni Channel along with increasing offshore oil and gas development would lead to more industrial activity and shipping within Cook Inlet, which could increase the likelihood of industrial spills or shipping accidents.

Although climate change may decrease streamflow in the Park long-term, it is not expected to cumulatively impact water quality or surface water hydrology during the Planning Phase activities.

3.7.2.3 Option 3 – Conveyance of North Transportation Corridor and Hungryman Creek Port Area

Phase 1 – Planning Phase Activities

Option 3 includes more restrictive Terms and Conditions for the Planning Phase activities that would help limit water quality and surface water hydrology impacts compared to Option 2. For example, no more than 20 helicopter landing sites would be allowed under Option 3. Each helipad would be 14 by 14 feet or 0.0045 acre in size, producing a total helipad disturbance area of 0.09 acre across the Project easements. The number of exploratory drilling locations would also be capped at 150 in the north transportation corridor and 100 in the Hungryman Creek port area easement during the five-year Planning Phase. These restrictions would limit total disturbance from drill pads in the transportation and port area easements to less than 2.5 acres.

The smaller disturbance footprint for helipads and drill pads under Option 2 would reduce the magnitude of expected water quality impacts from soil erosion.

Other proposed NPS Terms and Conditions that would help limit water quality and hydrology impacts include maintaining a buffer distance of at least 50 feet from flowing water when constructing new helipads and drilling pads, and avoiding drill pad construction in standing water and wetland areas. Where possible, helipads would be sited in open areas with minimal need for brush clearing, or in shrubland ecotypes that regrow more quickly than native trees. These practices would reduce indirect water quality impacts from vegetation clearing and erosion.

Option 3 also includes a provision requiring consideration of stream flow rates when pumping surface water to mix drilling fluid. If stream levels are extremely low and intake flows cannot be maintained, field crews would be required to find another water source or stop work until flows increase. This provision would help maintain existing surface water hydrology by focusing pumping on drainages that have higher in-stream flow rates. Other relevant provisions include containing spent drilling fluids and cuttings in excavated, unlined sumps with at least 1.5 feet of freeboard below the native ground surface and installing silt fence downgradient to contain any overflow from the sumps. These measures would limit or contain accidental releases of drilling fluid into the environment, helping to prevent surface water quality impacts.

Phases 2 and 3 – Construction and O&M

Impacts would be the same as described for Option 2.

Additional Impacts from Planned Actions

Under Option 3, cumulative water quality and surface water hydrology impacts would be less than Option 2 due to the lower intensity of development planned in the transportation corridor and port area easement, and the more restrictive Terms and Conditions for water quality protection.

3.7.2.4 Option 4 – Conveyance of South Transportation Corridor and Deep Water Port Area

Phase 1 – Planning Phase Activities

The type, magnitude, and duration of water quality and surface water hydrology impacts under Option 4 would be the same as Option 3. However, northeast of Bear Pass, the location of potential impacts would shift to the south transportation corridor and the Deep Water port area easement. Other than this location change, there would be no difference in water quality and surface water hydrology impacts between the Option 3 and Option 4 easements.

Phases 2 and 3 – Construction and O&M

Impacts would be the same as described for Options 2 and 3.

Additional Impacts from Planned Actions

Impacts would be the same as described for Option 3.

3.7.2.5 Comparative Conclusion of Options

Under Option 1, there would be no change to water quality and surface water hydrology in the Project area, and the Park would continue to be managed as it is currently.

Option 2 would result in the greatest potential for water quality and surface water hydrology impacts because of the higher intensity of development and less restrictive Terms and

Conditions implemented to protect water quality and surface water hydrology. Impacts could occur due to erosion from helipad and drill pad construction, pumping surface water from streams to mix drilling fluid, and accidental spills of fuel transported to and stored at the drilling locations.

Options 3 and 4 would have similar types of water quality and surface water hydrology impacts. However, the location of potential impacts would differ between the two options. Under Option 3, water quality and surface water hydrology impacts would occur in the north transportation corridor and Hungryman Creek port area easement. Under Option 4, impacts would occur in the south transportation corridor and the Deep Water port area easement.

3.8 SOUNDSCAPES

3.8.1 Current and Expected Future Conditions of the Environment

The soundscape is defined as the acoustic environment perceived by humans. Noise is generally defined as loud, unpleasant, unexpected, or undesired sound that is typically associated with human activity and interferes with or disrupts normal activities. The standard unit of sound pressure measurement is the decibel. The process to adjust for human hearing is termed “A weighting,” and the resulting decibel level is termed the “A weighted decibel.”

The Johnson Tract is located in a remote region of the Park. The nearest areas with the highest seasonal human use are located along the Tuxedni Channel and Silver Salmon Creek, located 13 and 22 miles away, respectively. Sounds in the Project area are natural, with little recreation use or other human-created noise. The median summer, daytime sound level is expected to be between 31 and 37 decibels (NPS 2020a). For context, the sound level representing the threshold of audibility for humans is 0 decibels, the median acoustic environment across the NPS is 25 decibels (Lynch et al. 2011), and a quiet room is 40 decibels (FHWA 2017).

The most common natural sources of sound may be associated with flowing water, wind, precipitation, rock and snow avalanches, and wildlife. Areas along the coast would have the highest sound level due to strong winds, breaking waves, ice movements, and bird calls (CIRI and Westmin Resources 1994). The most common source of noise is aircraft transversing the area. Most air traffic is concentrated along the Cook Inlet coastline (NPS 2020a). Other local noise sources include passing vessel traffic, a few year-round residences near the coast, seasonal use of small recreational cabins or camps, shore fishery set net sites, and the old cannery at Snug Harbor on Chisik Island (CIRI and Westmin 1994).

3.8.1.1 Additional Trends and Planned Actions

As part of the Cook Inlet Planning Area Oil and Gas Lease Sale 258 (which took place December 30, 2022), there is potential for oil and gas exploration and development in Cook Inlet; however, a July 2024 judicial ruling suspended the lease sale (U.S. District Court of Alaska Case No. 3:22-cv-00279-SLG). It is unclear if the lease sale will be permitted at this time. If permitted, oil and gas activities from vessel and aircraft offshore during exploration and development could increase noise levels and affect the soundscape near the Park. There are currently no additional trends or planned actions that would impact soundscapes in the Project area. There are no plans for other management changes in the proximity of the Project that would impact soundscapes. The Park and the surrounding areas would continue to be managed in ways similar to current conditions.

3.8.2 Environmental Consequences

3.8.2.1 Option 1 – No Action

Impacts of Option 1

Under Option 1, the easements would not be conveyed for either a port or a transportation route and the conditions of ANCSA and the 1976 Act would not be fulfilled. As a result, impacts to soundscapes would be the same as described above, in the “Current and Expected Future Conditions of the Environment.”

Additional Impacts from Planned Actions

Under Option 1, an easement would not be conveyed and there would be no impacts to soundscapes; therefore, the environment would remain the same as or similar to the “Current and Expected Future Conditions of the Environment” section. Past, present, and reasonably foreseeable actions and their impacts would be the same as those described in the “Current and Expected Future Conditions of the Environment” section.

3.8.2.2 Option 2 – CIRI’s Initial Proposal

Phase 1 – Planning Phase Activities

Under Option 2, Planning Phase activities would occur in both the north and south transportation corridor and the full port easement area.

During the proposed Planning Phase, human noise could be present primarily from June to September annually in the area and potentially increase impacts to soundscapes. Most survey work would be completed via walking through the easement areas while collecting various data. Access to the area for pedestrian surveys would require the use of helicopters, which would be the greatest source of human-introduced noise in and around the easement areas. While certain activities have associated limits on helicopter flying times, there are no Terms and Conditions that would limit total annual flying time in Option 2. Landings in the Park would be restricted to the easement areas.

Another source of human-introduced noise in and around the easement areas would be associated with drilling, including vegetation clearing for and construction of drill pads. The estimated time to complete drilling would be 120 field days. Drill pads would be temporary, constructed of wood timber, and placed with minimal surface disturbance with a typical footprint of 20 by 20 feet. Vegetation clearing would involve the use of chainsaws and other power tools that would increase noise. During geotechnical drilling, 50 to 150 boreholes would be estimated for the transportation corridor.

Anticipated sound ranges from geotechnical drill rigs are 70-85dB at 50ft (FHWA 2017). NPS also anticipates 48 drill holes (120 field days per year, 2 drill rigs in operation, and completed every 5 days) to be completed per year resulting in approximately 384 hours of drilling time per year (48 drill holes requiring 8 hours of active drilling).

The CIRI Terms and Conditions do not include limits to brushing activities, the number and size of helicopter pads, underwater decibel levels, annual activity windows, or aircraft operation. Additionally, the CIRI Terms and Conditions do not limit ground-disturbing activities or the total time that the activities could occur. Therefore, impacts to soundscapes under Option 2 would be greater in extent, duration, and intensity than impacts under Options 3 and 4.

Phases 2 and 3 – Construction and O&M

The Construction and O&M of a port and a road/rail would increase human-generated sounds in and around the easement areas. Noise impacts would increase if noise-generating Construction or O&M equipment was operated simultaneously and within close distances. Typical noise-generating construction equipment includes chain saws, pile drivers, ground compactors, air compressors, dump trucks, excavators, and generators, though it is not known at this time what construction equipment or methods would be used for port and road/rail construction. Project activities for Construction include excavation, blasting, and construction. If haul trucks, vessels, helicopters, all-terrain or utility-task vehicles, and other similar heavy equipment are used for O&M of a port and mining road/rail, noise in the Project area would increase. However, the degree to which O&M activities would impact the soundscape cannot be determined at this time because impacts would depend on factors such as what types of vehicles or machinery are used, how many would be operated, the expected run-times, and what times during the year the vehicles or machinery would be used.

Additional Impacts from Planned Actions

Combined impacts from reconnaissance surveys and subsurface testing have the potential to adversely impact existing soundscapes. Additional potential for impacts from planned actions to soundscapes is low in the Project area. Planned activities such as the potential for future oil and gas development could increase human-induced noise in the Project area.

3.8.2.3 Option 3 – Conveyance of North Transportation Corridor and Hungryman Creek Port Area

Phase 1 – Planning Phase Activities

Under Option 3, Planning Phase activities, Construction, and O&M within the north transportation corridor and Hungryman Creek port area easement would increase human-generated noise in the Park. The remote nature of the Project area limits access and use by visitors, minimizing the impact of human noise on visitor experience. The distance to high visitation areas, greater than 13 miles, reduces the probability of noise impacts at those sites (NPS 2020a).

Most noise generated from Planning Phase activities is expected to be short-term (lasting less than a season) and intermittent. The NPS Terms and Conditions include limitations that would help to reduce human-generated noise in the Park. No more than 70 hours of helicopter flight time per operating season would be allowed for work within the transportation corridor, and no more than 20 hours of helicopter flight time per operating season would be allowed for work within the port easement, which would help to limit noise impacts from helicopters in the Project area. Additionally, the NPS Terms and Conditions include limits on brushing activities, the number and size of helicopter pads, underwater decibel levels, annual activity windows, and aircraft operation. The NPS Terms and Conditions limit ground-disturbing activities and the total time that the activities could occur.

Anticipated sound ranges from geotechnical drill rigs are 70-85dB at 50ft (FHWA 2017). NPS also anticipates 48 drill holes (120 field days per year, 2 drill rigs in operation, and completed every 5 days) to be completed per year resulting in approximately 384 hours of drilling time per year (48 drill holes requiring 8 hours of active drilling).

Phases 2 and 3 – Construction and O&M

Impacts would be the same as described for Option 2.

Additional Impacts from Planned Actions

3.8.2.4 Option 4 – Conveyance of South Transportation Corridor and Deep Water Port Area

Phase 1 – Planning Phase Activities

Under Option 4, the impacts would be the same as the impacts for Option 3. The only difference would be the location of the transportation corridor and port area easement to the south transportation corridor and Deep Water port area easement.

Anticipated sound ranges from geotechnical drill rigs are 70-85dB at 50ft (FHWA 2017). NPS also anticipates 48 drill holes (120 field days per year, 2 drill rigs in operation, and completed every 5 days) to be completed per year resulting in approximately 384 hours of drilling time per year (48 drill holes requiring 8 hours of active drilling).

Phases 2 and 3 – Construction and O&M

Impacts would be the same as described for Option 2.

Additional Impacts from Planned Actions

Impacts would be the same as described for Option 2.

3.8.2.5 Comparative Conclusion of Options

Under Options 2, 3, and 4, there would be a small impact to the natural soundscape. Under Option 3, noise would be generated from the north transportation corridor and the Hungryman Creek port area easement. Under Option 4, noise would be generated from the south transportation corridor and the Deep Water port area easement. Option 2 includes both the north and south transportation corridors and the full port area easement. Under Option 2, the type of impacts would be the same as Options 3 and 4, but would occur over a larger area for Planning Phase activities, Construction, and O&M, which may lead to greater soundscape impacts than Options 3 and 4. Option 2 also includes less restrictive Terms and Conditions, which could lead to greater levels of noise in the Project area during the Planning Phase. The primary differences between the options during Planning Phase activities are the land areas impacted and the Terms and Conditions applied, which would affect the spatiotemporal extent and intensity of impacts; however, the type of impacts to soundscapes would be the same between Options 3 and 4, and greatest under Option 2.

Impacts would be greater for all options during the Construction and O&M of a port and road/rail; however, the duration, extent, and severity of potential impacts for all options related to Construction and O&M activities cannot be accurately estimated at this time due to the absence of engineering plans.

3.9 WETLANDS

3.9.1 Current and Expected Future Conditions of the Environment

Wetlands and waters encompass about 10 percent (approximately 415,000 acres) of the Park (USFWS 2020), of which approximately half are freshwater wetlands (Table 3-4). Estuarine and marine wetlands are the least common class of wetlands and waters, accounting for <1 percent

of the total area of the Park. Wetlands in the area of proposed easements include palustrine broad-leaved deciduous shrublands and emergent wetlands on terraces and mountain toeslopes along the Johnson River and in the lower Bear Creek valley (USFWS 2020). The majority of these wetlands are hydrologically connected to the Johnson River and are often associated with beavers, the dams of which impound water, elevating the water table of surrounding lands and forming marshes and shallow ponds in some areas. Palustrine shrub wetlands range from continuously saturated to seasonally flooded and are characterized by low willows, including *Salix pulchra* and *S. fuscescens*, sweetgale (*Myrica gale*), and dwarf birch (*Betula nana*) (Wells et al. 2013). A diverse array of hydric forbs and graminoids occurs, including marsh cinquefoil (*Potentilla palustris*), water horsetail (*Equisetum fluviatile*), Northwest Territory sedge (*Carex utriculata*), silvery sedge (*C. canescens*), and, near to the coast, Lyngbye's sedge (*C. lyngbyei*). Palustrine emergent wetlands range from seasonally saturated to permanently flooded and are characterized by wet sedge meadows and marshes. Dominant sedges are commonly Northwest Territory sedge, water sedge (*C. aquatilis*), rock sedge (*C. saxatilis*), and, near the coast, Lyngbye's sedge. Estuarine and marine wetlands are common in areas of the port area easement affected by the influx of tides. Throughout the estuarine wetlands are salt marshes that range from irregularly flooded by tide waters in the upper portions to regularly flooded in the lower portions. Upper salt marshes in the proposed easements are dominated by Lyngbye's sedge wet meadows, while lower salt marsh plant communities are dominated by lesser saltmarsh sedge (*Carex glareosa*), Ramensk's sedge (*C. ramenskii*), American dunegrass (*Leymus mollis*), and goose tongue (*Plantago maritima*) (Jorgenson et al. 2010). Marine wetlands occur below the lower salt marshes and encompass unvegetated mudflats that are regularly flooded by tide waters. Riverine wetlands also occur in the proposed easements, including eight headwater streams and three upper perennial rivers (USFWS 2020). At least one species of conservation concern (*Puccinellia andersonii* - G4G5 S1S2) has the potential to occur in the Tuxedni salt marshes (Alaska Center for Conservation Science 2024; NPS 2024i).

Table 3-4. Area of Wetlands and Waters in Lake Clark National Park and Preserve

Wetland and Waters Type	Acres	Percent of Total Park Area
Estuarine and Marine	8,431	<1%
Freshwater	196,945	5%
Lake	137,069	3%
Riverine	72,478	2%
<i>Wetland and Waters Subtotal</i>	<i>414,923</i>	<i>10%</i>
<i>Uplands</i>	<i>3,624,401</i>	<i>90%</i>
Grand Total	4,039,324	100%

Source: USFWS 2020

3.9.1.1 Additional Trends and Planned Actions

As part of the Cook Inlet Planning Area Oil and Gas Lease Sale 258 (which took place December 30, 2022), there is potential for oil and gas exploration and development in Cook Inlet; however, a July 2024 judicial ruling suspended the lease sale (U.S. District Court of Alaska Case No. 3:22-cv-00279-SLG). Consequently, of the 193 tracts offered, only one lease was issued, which is located approximately 12 miles offshore from the southeast coast of the Park. If this lease were developed, impacts could occur to coastal wetlands (for example, salt marshes) in the event of leaked contaminants or a spill.

Climate change has resulted in increasing temperatures across all of Alaska over the past several decades (Ballinger et al. 2023). On the east side of the Park, the temperature has increased by approximately 0.3 degrees Celsius per decade between 1957 and 2021. During this same period, precipitation in this area has remained approximately the same or increased slightly. If these trends of increasing temperature and consistent or increasing precipitation continue, then wetlands in the area of proposed easement may begin to dry. In conjunction with warming, tectonic uplift along the coast could lead to further drying of wetlands as relative sea level drops. Mid-century projections based on a high emissions scenario suggest a drop in relative sea level of greater than 0.3 meter (IPCC 2022; NASA 2024). As a result, seaward migration of salt marshes is likely as tidally inundated areas equilibrate to changes in sea level.

3.9.2 Environmental Consequences

National Wetlands Inventory mapping was used to estimate the total area of wetlands in the Park (Table 3-4) to describe the existing conditions and to provide general context for the impact analysis. Impacts to wetlands were assessed using the aquatic resources mapping provided by CIRI. The aquatic resources mapping was performed at a finer spatial scale (more detailed) than the National Wetlands Inventory, used more recent satellite imagery and elevation data than the National Wetlands Inventory mapping, and was partially informed by field data (Stantec 2023). The acres of each aquatic resource status class were calculated for the two proposed transportation corridor easements and the port area easement. For the transportation corridors, a 1,000-foot-wide corridor was used for analysis purposes. However, it should be noted that the actual area of the proposed easements would be less than the area analyzed; therefore, the area estimates presented in the following section for the Planning Phase represent overestimates of the actual areas that would be conveyed. For the purposes of this analysis, the Wetland – Questionable class was aggregated into the Wetland class, and the Upland – Questionable class into the Upland class. The aquatic resources mapping is a preliminary wetland mapping product for use in the Planning Phase and does not constitute an official wetland delineation.

Wetland status acres for each option are presented in Table 3-5 and Table 3-6.

Table 3-5. Wetland Status Acres by Proposed Transportation Corridor Easement Option

Type	Wetland Status	North + South Transportation Corridor (Option 2) Acres	Percent of Total Option 2	North Transportation Corridor (Option 3) Acres	Percent of Total Option 3	South Transportation Corridor (Option 4) Acres	Percent of Total Option 4
Wetlands and Waters	Relatively Permanent Water	16	1%	12	1%	14	1%
Wetlands and Waters	Waterbody	5	<1%	5	<1%	5	<1%
Wetlands and Waters	Wetland	99	8%	99	10%	99	10%
Wetlands and Waters Total	–	120	9%	116	11%	118	12%

Type	Wetland Status	North + South Transportation Corridor (Option 2) Acres	Percent of Total Option 2	North Transportation Corridor (Option 3) Acres	Percent of Total Option 3	South Transportation Corridor (Option 4) Acres	Percent of Total Option 4
Uplands	Upland	1,144	91%	920	89%	885	88%
Grand Total ¹	–	1,264	100%	1,036	100%	1,003	100%

¹ Note that the difference in total acres estimated in this table compared to the acres reported for the transportation corridors in Chapter 2 is due to the lack of wetland status mapping in small areas of the proposed transportation corridors.

Source: Wetlands data were received from the NPS but originated from HighGold Mining using aquatic resources mapping data from Stantec (2023).

Table 3-6. Wetland Status Acres for the Proposed Port Area Easement

Type	Wetland Status	Full Port Area (Option 2) Acres	Percent of Total Option 2	Hungryman Creek Port Area (Option 3) Acres	Percent of Total Option 3	Deep Water Port Area (Option 4) Acres	Percent of Total Option 4
Wetlands and Waters	Relatively Permanent Water	19	1%	1	<1%	9	2%
Wetlands and Waters	Traditional Navigable Water	15	1%	4	2%	7	1%
Wetlands and Waters	Waterbody	6	<1%	1	<1%	1	<1%
Wetlands and Waters	Wetland	219	17%	18	7%	3	1%
Wetlands and Waters Total	–	259	20%	24	9%	20	4%
Uplands	Upland	1,047	80%	240	91%	529	96%
Grand Total ¹	–	1,306	100%	264	100%	549	100%

¹ Note that the difference in total acres estimated in this table compared to the acres reported for the port easements in Chapter 2 is due to the lack of wetland status mapping in small areas of the proposed port easements.

Source: Wetlands data were received from the National Park Service but originated from High Gold Mining using aquatic resources mapping data from Stantec (2023).

3.9.2.1 Option 1 – No Action

Impacts of Option 1

Under Option 1, the easements would not be conveyed for either a port or a transportation route and the conditions of ANCSA and the 1976 Act would not be fulfilled. As a result, impacts

to wetlands would be the same as described above, in the “Current and Expected Future Conditions of the Environment.”

Additional Impacts from Planned Actions

Under Option 1, an easement would not be conveyed and there would be no impacts to wetlands; therefore, the environment would remain the same as or similar to the “Current and Expected Future Conditions of the Environment” section. Past, present, and reasonably foreseeable actions and their impacts would be the same as those described in the “Current and Expected Future Conditions of the Environment” section.

3.9.2.2 Option 2 – CIRI’s Initial Proposal

Phase 1 – Planning Phase Activities

The Option 2 transportation corridor easement would convey an easement covering 120 acres of wetlands and waters and 1,144 acres of uplands for a total of 1,264 acres (Table 3-5). Waterbodies and relatively permanent waters (specifically, perennial rivers and streams) make up a relatively small percentage of the area. The majority of the wetlands and waters in the proposed transportation corridor easements are located in the Johnson River Valley near where the corridor turns north toward Bear Pass. This area is characterized by palustrine slope wetlands with a complex of beaver dams and associated ponds, as well as a broad expanse of palustrine wetlands on a terrace of the Johnson River. Wetlands and waters in the proposed transportation corridor easement from approximately Bear Pass to the northeast are predominantly perennial headwater creeks that flow into Tuxedni Bay. Impacts to wetlands in the Option 2 transportation corridor easement would be substantial as this option has less restrictive Terms and Conditions for wetlands aside from water quality. This could result in substantial loss or degradation of up to 120 acres of wetlands in the transportation corridor.

The port area easement would convey an easement covering 259 acres of wetlands and waters, and 1,047 acres of uplands for a total of 1,306 acres (Table 3-6). The majority of the wetlands and waters in the proposed port area easement are associated with the floodplain and adjacent terraces of Bear Creek, including several beaver dam complexes and upper saltmarshes along Tuxedni Bay. Tuxedni Bay is a Traditional Navigable Water, and only a small portion of the bay occurs within the proposed port area easement. Traditional Navigable Waters are waters subject to the ebb and flow of the time and/or that were historically used, are presently used, or have the potential to be used in the future to transport interstate or foreign commerce (33 CFR § 329.4). Lastly, relative permanent waters, those waters which connect downstream directly or through tributaries to a Traditional Navigable Water (Stantec 2023), are represented by the lower reaches of Hungryman Creek, Bear Creek, and an unnamed creek to the southeast. Because of the less restrictive Terms and Conditions compared to Options 3 and 4, Option 2 could result in substantial loss or degradation of up to 259 acres of wetlands in the port area.

Impacts to wetlands during the Planning Phase may occur from the following Planning Phase activities and are described below: pedestrian surveys, vegetation clearing, and geotechnical drilling.

Pedestrian surveys for engineering and cultural and environmental resources would affect wetlands through trampling of vegetation. Trampling and compaction from pedestrian surveys would have short-term, minor impacts on wetlands since travel through wetlands would be on foot and would not be concentrated in any one area for extended periods. Under the CIRI Terms and Conditions, temporary hand excavation of shallow (0.5 by 0.5 by 1 meter) soil test pits could occur in wetland; however, the number of test pits would be limited by the number of

field staff and the duration of field surveys, which is assumed to be 4–5 people for 10 days for cultural resources and 2–4 for 8 days for engineering surveys. This would considerably constrain the number of test pits in wetlands considering that test pits would also be sampled in uplands during field surveys. The CIRC Terms and Conditions require that test pits that do not collapse in upon themselves be backfilled, which would help to mitigate the impacts to wetland soils and vegetation and allow natural revegetation and reduce the potential for erosion. Given the small size of the test pits, limited duration of field surveys, and backfilling requirement, impacts to wetlands from test pits would be short-term, minor, and would be expected to recover quickly (1–2 years).

During the Planning Phase, vegetation clearing would occur to prepare helicopter land sites (14 by 14 feet, 0.004 acre each) and temporary drill pads (20 by 20 feet, 0.1 acre each). Under the CIRC Terms and Conditions, creating helicopter landing sites and temporary drill pads in wetlands is not prohibited, and the number of helicopters would be unrestricted. If helicopter landing pads and temporary drill pads were to be placed in wetlands, this would result in short-term, minor impacts on herbaceous wetlands, and short- to long-term, moderate impacts in shrub and forested wetlands. Impacts to shrub and forested wetlands would be greater due to the longer recovery time required for woody vegetation relative to herbaceous vegetation, the latter of which would not need to be cleared. Given the unrestricted number of helicopter landings sites, it is not possible to estimate the total area of vegetation clearing. The number of boreholes (and thus temporary drill pads) necessary during the Planning Phase is estimated to be between 50 and 150 for the transportation corridor and between 20 and 100 for the port area easement (Section 2.1), which would result in the 1.5 acres and 1.0 acre of vegetation clearing in the Option 2 transportation and port easements, respectively. Assuming all the temporary drill pads were placed in wetlands, this would result in 1.3 percent of wetlands in the transportation corridor and 0.4 percent of wetlands in the port area easement being impacted. However, it is unlikely that all of the drill pads would be placed in wetlands since wetlands do not provide the ideal substrate to prepare helicopter landing zones or to construct temporary drill pads due to the wet, organic soils. Thus, it is likely that few to no helicopter landing zone or drill pads would be placed in wetlands. Assuming no helicopter landing zones or drill pads would be placed in wetlands, then impacts to wetlands from vegetation clearing would be negligible. However, since the CIRC Terms and Conditions do not specifically prohibit vegetation clearing for helicopter landing zones and temporary drill pads, it is possible that impacts would occur in wetlands from this Planning Phase activity and would be short- to long-term, and minor to moderate in intensity depending on the type of wetland (herbaceous versus shrub/forest) impacted and the number of helicopter landing sites and temporary drill pads placed in wetlands.

Geotechnical drilling during the Planning Phase would involve building temporary drill pads, drilling geotechnical boreholes, and managing and disposing of drilling materials. Under the CIRC Terms and Conditions, constructing and operating temporary drill pads in wetlands would not be prohibited and there are no set back requirements for drill pads from running waters. However, the CIRC Terms and Conditions do specify that drilling materials will not be discharged directly into any standing or flowing water or vegetated areas. While wetland soils are not an ideal substrate for constructing drill pads, since the CIRC Terms and Conditions do not specifically prohibit temporary drill pads, it is possible that impacts would occur in wetlands from this Planning Phase activity. Impacts would include soil compaction, vegetation clearing (as discussed above), temporary disruption to the wetland hydrology in the vicinity of the drill pads, and an elevated of contamination from potential spills. The impacts would be short- to long-term, and minor to moderate in intensity depending on the type of wetland (herbaceous

versus shrub/forest) impacted. In addition, in the event of an accidental spill or leak of drilling materials, fuel, or lubricants from a drill pad in wetlands area, the contaminants would be discharged directly into the wetlands. Therefore, the risk of contamination of wetlands and waters would be moderate, and in the event that contamination did impact wetlands and waters, the impacts would be short- to long-term and moderate- to high-intensity.

In summary, as a result of the less restrictive Terms and Conditions, this option could result in substantial loss or degradation of up to 120 acres of wetlands in the transportation corridor and up to 259 acres of wetlands in the port area, which would total 379 acres of wetlands. In addition, because wetlands encompass a relatively small area (approximately 10 percent) of the Park (USFWS 2020), any impacts to wetlands have a disproportionate effect on this resource. The substantial loss of wetlands could require consultation, possible permitting with the U.S. Army Corps of Engineers, and a wetland statement of findings per Director's Order 77-1.

Phases 2 and 3 – Construction and O&M

The transportation corridor easement would be reduced from 1,000 feet wide during Planning Phase actions to 250 feet wide and 100 feet wide for Construction and O&M, respectively (Table 1-2). Because there are no site-specific designs or plans for Construction and O&M of the port or rail/road, including the alignment of the road/rail, impacts to wetlands cannot be accurately estimated at this time. CIRI has indicated that they would like the large port area for siting purposes and that it will be reduced in later phases; however, the extent of the reduction is not currently known. Once sufficient detail is developed, additional environmental review and permitting, along with development of additional Terms and Conditions for these activities, would occur. Any loss or degradation of wetlands could require consultation, possible permitting with the U.S. Army Corps of Engineers, and a wetland statement of findings per NPS Director's Order 77-1.

Additional Impacts from Planned Actions

Overall, the impacts of other trends and planned actions that may affect wetlands are described above in the "Current and Expected Future Conditions of the Environment." As discussed, increasing temperatures related to climate change could lead to drying and loss of wetland areas and tectonic uplift could lead to seaward migration of salt marshes. Oil and gas development in Cook Inlet could result in degradation to wetlands along coastal areas (specifically, salt marshes) in the event of a leak or spill.

As noted above, the Planning activities could have substantial adverse impacts to wetlands under this option due to the less restrictive Terms and Conditions. There is also potential for substantial loss and degradation of wetlands from Construction and O&M within the easement areas. These activities, in addition to the other trends and planned actions, would have substantial adverse effects to the existing conditions of wetlands.

3.9.2.3 Option 3 – Conveyance of North Transportation Corridor and Hungryman Creek Port Area

Phase 1 – Planning Phase Activities

The Option 3 transportation corridor easement would convey an easement that encompasses 116 acres of wetlands and waters and 920 acres of uplands for a total of 1,036 acres (Table 3-5). Waterbodies and relatively permanent waters (specifically, perennial rivers and streams) make up a relatively small percentage of the area. The majority of the wetlands and waters in the proposed transportation corridor easements are located in the Johnson River Valley near where the corridor turns north toward Bear Pass. This area is characterized by palustrine slope

wetlands with a complex of beaver dams and associated ponds, as well as a broad expanse of palustrine wetlands on a terrace of the Johnson River. Wetlands and waters in the proposed transportation corridor easement from approximately Bear Pass to the northeast are predominantly perennial headwater creeks that flow into Tuxedni Bay.

Under Option 3, 24 acres of wetlands and waters and 240 acres of uplands, for a total of 264 acres (Table 3-6), would be subject to the easement conveyed for the Hungryman Creek port area. The majority of the wetlands and waters in the proposed port area easement are associated with the floodplain and adjacent terraces of Bear Creek, including several beaver dam complexes and upper saltmarshes along Tuxedni Bay. Relatively permanent waters are represented by the lower reaches of Hungryman Creek and Bear Creek. Lastly, Tuxedni Bay is a Traditional Navigable Water, and only a small portion of the bay occurs within the proposed port area easement.

In general, the Term and Conditions specify that every effort will be made to minimize adverse impacts to wetlands and floodplains. However, impacts to wetlands during the Planning Phase may occur from the following Planning Phase activities and are described below: pedestrian surveys, vegetation clearing, and geotechnical drilling.

Pedestrian surveys for engineering and cultural and environmental resources would affect wetlands through trampling of vegetation. Trampling and compaction from pedestrian surveys would have negligible impacts on wetlands since travel through wetlands would be on foot and would not be concentrated in any one area for extended periods. This is because temporary excavation of shallow (0.5 by 0.5 by 1 meter) soil test pits would not occur in wetlands as per the Terms and Conditions, and instead field staff would only be passing through wetlands when traversing the easement. In addition, the number of field staff and the duration of field surveys, which is assumed to be 4–5 people for 10 days for cultural resources and 2–4 for 8 days for engineering surveys, would provide for a relatively low concentration of people and dispersed travel across the wetlands in the Option 2 easement. This is because only 10 percent of the easement is wetlands, and therefore, field crews would be able to limit most of their travel to uplands.

During the Planning Phase, vegetation clearing would occur to prepare helicopter land sites (14 by 14 feet) and temporary drill pads (20 by 20 feet). Vegetation clearing would have little impact on wetlands during the Planning Phase. This is because the Terms and Conditions prohibit creating helicopter landing sites or drilling in wetlands (and hence, no vegetation would be cleared to construct drill pads in wetlands).

Geotechnical drilling during the Planning Phase would involve building temporary drill pads, drilling geotechnical boreholes, and managing and disposing of drilling materials. Geotechnical drilling would have little impact on wetlands during the Planning Phase since the Terms and Conditions prohibit drilling in wetlands and standing water. The Terms and Conditions also state that drilling materials will not be discharged directly into any standing or flowing water or vegetated areas and that drill pads and sumps should be kept at least 50 feet from flowing water. In the event of an accidental spill or leak of drilling materials, fuel, or lubricants, the Terms and Conditions include mitigation measures (such as secondary containment) and remedial actions (such as a spill response plan) to prevent and address environmental contamination. Therefore, the risk of contamination of wetlands and waters would be low, and in the event that contamination did impact wetlands and waters, the impacts would be short-term and low intensity.

As a result of the Terms and Conditions, impacts to wetlands from the above-described Planning Phase activities are anticipated to be short-term and minor. This is because the disturbance intensity will be low, and the extent of wetlands impacted by these activities will be small relative to the total extent of wetlands in the easements. However, given that wetlands encompass a relatively small area (approximately 10 percent) of the Park, any impacts to wetlands have a disproportionate effect on this resource.

Phases 2 and 3 – Construction and O&M

The transportation corridor easement would be reduced from 1,000 feet during Planning Phase actions to 250 feet wide and 100 feet wide for Construction and O&M, respectively (Table 1-2). Because there are no site-specific designs or plans for Construction and O&M of the port or rail/road, including the alignment of the road/rail, impacts to wetlands cannot be accurately estimated at this time. The port area easement may be reduced in size after Planning activities. If the port area easement under this option is fully constructed, it could result in substantial loss or degradation of up to 24 acres of wetlands in the port area easement. Once sufficient detail is developed, additional environmental review and permitting, along with development of additional Terms and Conditions for these activities, would occur. Any loss or degradation of wetlands could require consultation, possible permitting with the U.S. Army Corps of Engineers, and a wetland statement of findings per Director's Order 77-1.

Additional Impacts Trends and Planned Actions

Overall, the impacts of other trends and planned actions that may affect wetlands are described above in the "Current and Expected Future Conditions of the Environment." As discussed, increasing temperatures related to climate change could lead to drying and loss of wetland areas and tectonic uplift could lead to seaward migration of salt marshes. Oil and gas development in Cook Inlet could result in degradation to wetlands along coastal areas (specifically, salt marshes) in the event of a leak or spill.

As noted above, the Planning activities would have largely negligible impacts to wetlands under this option due to the restrictive Terms and Conditions; however, there is potential for substantial loss and degradation of wetlands from Construction and O&M within the easement areas. These activities, in addition to the other trends and planned actions, would adversely affect the existing conditions of wetlands.

3.9.2.4 Option 4 – Conveyance of South Transportation Corridor and Deep Water Port Area

Phase 1 – Planning Phase Activities

The Option 4 transportation corridor easement would convey an easement covering 118 acres of wetlands and waters and 885 acres of uplands, for a total of 1,003 acres (Table 3-5).

The Deep Water port area easement will convey an easement covering 20 acres of wetlands and waters and 529 acres of uplands, for a total of 549 acres (Table 3-6). The majority of the wetlands and waters in the proposed port area easement are associated with the relatively permanent waters of an unnamed creek southeast of Bear Creek. Lastly, Tuxedni Bay is a Traditional Navigable Water, and only a small portion of the bay occurs within the proposed port area easement.

Otherwise, Planning Phase impacts to the wetlands and waters would be the same as those described under Option 3.

Phases 2 and 3 – Construction and O&M

Impacts would be the same as described for Option 3, except that the port area under Option 4 would convey an easement covering 4 acres less wetlands than that under Option 3 (Table 3-6). Therefore, the Construction and O&M of the port area under Option 4 could result in substantial loss or degradation of up to 20 acres of wetlands in the port area easement if the entire easement area were constructed.

Additional Impacts from Planned Actions

Impacts would be the same as described for Option 3.

3.9.2.5 Comparative Conclusion of Options

Impacts to wetlands in the Option 4 transportation corridor easement are very similar to those for Options 2 and 3, the primary difference being that 2 more acres of relatively permanent waters would be impacted under Option 4 than under Option 3, and 2 fewer acres of relatively permanent waters would be impacted under Option 4 than under Option 2.

Options 3 and 4 would convey an easement covering the least acres of wetlands and waters across both the transportation corridors and port areas, with Option 4 slightly lower (138 acres) than Option 3 (140 acres) (Table 3-5 and Table 3-6). The acres of wetlands that would be subject to the easement conveyed under all transportation corridor options would be approximately the same (Table 3-5). Of the port area options, Options 3 and 4 would convey an easement covering approximately the same acres of wetlands, while Option 2 would convey an easement covering 11–13 times the area of wetlands compared to Options 3 and 4.

Options 3 and 4 have the same, more restrictive Terms and Conditions and would have negligible impacts to wetlands during Planning Phase activities. Option 2 has the least restrictive Terms and Conditions and could result in substantial loss and degradation of wetlands (379 acres) from Planning activities alone.

Because there are no site-specific designs for Construction and O&M and the alignment of the road/rail and design for the port area are not known, the acreage subject to the easement conveyed and impacts to wetlands cannot be accurately estimated for these phases. The duration, extent, and severity of potential impacts for all options related to Construction and O&M activities cannot be accurately estimated at this time due to the absence of engineering plans.

3.10 VEGETATION

3.10.1 Current and Expected Future Conditions of the Environment

At a broad scale, vegetation patterns in the area of proposed easements are driven largely by the maritime climate and the steep topography of the Aleutian Range. Sitka (*Picea sitchensis*) and Lutz (*P. X lutzii*) spruce forests are common at lower elevations near the coast, while small stands of Alaska paper birch (*Betula neoalaskana*) and cottonwood (*Populus trichocarpa*) forest occur in the forested zone in areas of relatively recent disturbance. Alder (*Alnus sinuata*) and willow (*Salix* spp.) shrublands and graminoid and forb meadows dominated by bluejoint (*Calamagrostis canadensis*) and fireweed (*Epilobium angustifolium*) occur as a mosaic across broad areas of uplands at middle elevations (Wells et al. 2013). At the highest elevations, alpine tundra is characterized by dwarf shrublands, which commonly include Alaska bellheather (*Harrimanella stelleriana*) and netleaf willow (*S. reticulata*); sedge meadows, including small-

awned sedge (*Carex microchaeta*) and short-stalked sedge (*C. podocarpa*); and lichen tundra (*Cladonia* spp.). Ecological processes also drive vegetation patterns in the area of proposed easement. Riverine flooding and sedimentation create a mosaic of cottonwood and spruce forests, alder and willow shrublands, and wetland vegetation on floodplains. The ebb and flow of tides in coastal environments form tidal flats characterized by salt marsh vegetation, including lesser saltmarsh sedge (*Carex glareosa*) and Ramensk's sedge (*C. ramenskii*) (Jorgenson et al. 2010). Freshwater wetland vegetation occurs in lowland and riverine environments in bogs and fens, depressions, off channel habitats on floodplains, on slopes with groundwater discharge, and along lake and pond margins. Bog vegetation is characterized by bog rosemary (*Andromeda polifolia*), roundleaf sundew (*Drosera rotundifolia*), bog cranberry (*Oxycoccus microcarpus*), and sphagnum mosses (*Sphagnum* spp.). Fen vegetation is characterized by Northwest Territory sedge (*Carex utriculata*), rock sedge (*C. saxatilis*), buckbean (*Menyanthes trifoliata*), and water horsetail (*Equisetum fluviatile*).

3.10.1.1 Additional Trends and Planned Actions

As part of the Cook Inlet Planning Area Oil and Gas Lease Sale 258 (which took place December 30, 2022), there is potential for oil and gas exploration and development in Cook Inlet; however, a July 2024 judicial ruling suspended the lease sale (U.S. District Court of Alaska Case No. 3.22-cv-00279-SLG). Of the 193 tracts offered, only one lease was issued, which is located approximately 12 miles offshore from the southeast coast of the Park. If this lease were developed, impacts could occur to coastal vegetation (for example, salt marsh vegetation) in the event of leaked contaminants or a spill.

On the east side of the Park, the temperature has increased by approximately 0.3 degrees Celsius per decade between 1957 and 2021. During this same period, precipitation in this area has remained approximately the same or increased slightly. If these trends of increasing temperature and consistent amounts of precipitation continue, then the composition of wetland vegetation may begin to change as the result of wetland drying. As outlined for wetlands in the section above, warming and tectonic uplift along the coast could lead to further drying of wetlands and salt marshes. Seaward migration of salt marshes is likely as tidally inundated areas equilibrate to sea level change. In addition, in a warmer climate, altitudinal tree line may shift upward with the result that forests and woodlands may expand to higher elevations. However, recent research in northern Alaska has shown that, while mean growing season air temperature is an important determinant of tree line, other non-climatic factors (such as soils) may mediate the air temperature effect (Maher et al. 2021). Warmer temperatures may also result in more frequent insect outbreaks that could result in vegetation mortality in the area of proposed easements (Berg et al. 2006).

3.10.2 Environmental Consequences

To assess impacts to vegetation, the map ecotype classes from Wells et al. (2013) located in the easements were aggregated up to vegetation structure classes (such as forest and woodland), and acres for each combination of physiography and vegetation structure class within each easement were calculated.

The acres of physiography and vegetation structure classes are shown in Table 3-7 and Table 3-8.

Table 3-7. Acres of Physiography and Vegetation Structure Classes by Proposed Transportation Corridor Option

Type	Physiography	Vegetation Structure	North + South Transportation Corridor (Option 2) Acres ¹	Percent of Total Option 2 ²	North Transportation Corridor (Option 3) Acres ¹	Percent of Total Option 3	South Transportation Corridor (Option 4) Acres ¹	Percent of Total Option 4 ²
Non-vegetated	Lowland	Lake Water	26	2%	10	1%	24	2%
Non-vegetated	Riverine	River Water	12	1%	12	1%	12	1%
Non-vegetated Total	–	–	38	3%	22	2%	36	4%
Vegetated	Lowland	Forests and Woodlands	2	<1%	2	<1%	2	<1%
Vegetated	Lowland	Shrublands	54	4%	54	5%	54	5%
Vegetated	Riverine	Forests and Woodlands	12	1%	12	1%	12	1%
Vegetated	Riverine	Shrublands	42	3%	42	4%	42	4%
Vegetated	Upland	Forests and Woodlands	191	15%	127	12%	153	15%
Vegetated	Upland	Shrublands and Meadows	938	73%	792	75%	717	71%
Vegetated Total	–	–	1,239	97%	1,029	98%	980	96%
Grand Total	–	–	1,277	100%	1,051	100%	1,016	100%

¹ Note that the difference in total acres estimated in this table compared to the acres reported for the transportation corridors in Chapter 2 is due to the fact these are calculated from raster data instead of vector data.

² The sum of individual values may not match subtotals due to rounding.

Source: Wells et al. (2013)

Table 3-8. Acres of Physiography and Vegetation Structure Classes for the Port Area Easement

Type	Physiography	Vegetation Structure	Full Port Area (Option 2) Acres	Percent of Total Option 2	Hungryman Creek Port Area (Option 3) Acres ^{1,2}	Percent of Total Option 3	Deep Water Port Area (Option 4) Acres	Percent of Total Option 4
Non-vegetated	Coastal	Barrens	19	1%	7	3%	2	<1%
Non-vegetated	Coastal	Nearshore Water	3	<1%	0	0%	3	1%
Non-vegetated	Coastal	Ponds and Marshes	2	<1%	0	0%	0	0%
Non-vegetated	Lowland	Lake Water	2	<1%	0	0%	0	0%
Non-vegetated	Riverine	River Water	2	<1%	<1	<1%	0	0%
Non-vegetated	Upland	Barrens	4	<1%	0	0%	4	1%
Non-vegetated Total	–	–	32	2%	7	3%	9	2%
Vegetated	Coastal	Meadows	159	12%	9	3%	16	3%
Vegetated	Lowland	Forests and Woodlands	98	7%	<1	<1%	8	1%
Vegetated	Lowland	Shrublands	60	5%	1	0%	0	0%
Vegetated	Lowland	Wet Meadows and Bogs	3	<1%	0	0%	0	0%
Vegetated	Riverine	Forests and Woodlands	207	16%	108	41%	94	17%
Vegetated	Riverine	Shrublands	51	4%	34	13%	11	2%
Vegetated	Upland	Forests and Woodlands	472	36%	22	8%	337	61%
Vegetated	Upland	Shrublands and Meadows	225	17%	83	31%	74	13%
Vegetated Total	–	–	1,275	98%	257	97%	540	97%
Grand Total	–	–	1,307	100%	264	100%	549	100%

¹ Note that the difference in total acres is due to the fact these are calculated from raster data instead of vector data.

² The sum of individual values may not match subtotals due to rounding.

Source: Wells et al. 2013

3.10.2.1 Option 1 – No Action

Impacts of Option 1

Under Option 1, the easements would not be conveyed for either a port or a transportation route and the conditions of ANCSA and the 1976 Act would not be fulfilled. As a result, impacts to vegetation would be the same as described above, in the “Current and Expected Future Conditions of the Environment.”

Additional Impacts from Planned Actions

Under Option 1, an easement would not be conveyed and there would be no impacts to vegetation; therefore, the environment would remain the same as or similar to the “Current and Expected Future Conditions of the Environment” section. Past, present, and reasonably foreseeable actions and their impacts would be the same as those described in the “Current and Expected Future Conditions of the Environment” section.

3.10.2.2 Option 2 – CIRI’s Initial Proposal

Phase 1 – Planning Phase Activities

The Option 2 transportation corridor would convey an easement covering 1,239 acres of vegetation and 38 acres of unvegetated lands for a total of 1,277 acres (Table 3-7). Upland shrublands and meadows, followed by upland forests and woodlands are the most abundant vegetation types under this option. These two upland vegetation types are the most common in the Maritime ecoregion of the Park, encompassing 312,019 acres and 64,247 acres, respectively, across all of the Park (Wells et al. 2013). Lowland shrublands would be the next most dominant vegetation type under this option. This vegetation type includes shrub-dominated wetlands occurring in the Johnson River Valley near where the transportation corridor turns north toward Bear Pass. Riverine shrublands, located on the Johnson River floodplain near the western terminus of the transportation corridor, would be next most dominant vegetation type under this option. The remaining vegetation types all represent 1 percent or less of the transportation corridor.

The Option 2 port area easement would convey an easement covering 1,275 acres of vegetation and 32 acres of unvegetated lands for a total of 1,307 acres (Table 3-8). Similar to the transportation corridor easements, upland shrublands and meadows are the most abundant vegetation types in Option 2, followed by upland forests and woodlands. Riverine forests and woodlands would be the next most dominant vegetation types under this option. These wooded areas occur on the floodplains and alluvial fans of Hungryman Creek, Bear Creek, and an unnamed creek to the southeast and are subject to periodic overbank flooding, which could elevate the risk of erosion in areas of ground disturbance. The next most dominant vegetation type in the port area easement is 159 acres of coastal meadows, which is 10–15 times the area of coastal meadows that would be conveyed under Options 3 and 4 and represents approximately 2 percent of the coastal meadows in the Park. Coastal meadows are relatively rare in the Park, representing 0.2 percent (9,884 acres) of the land area (Wells et al. 2013). Thus, any impacts to coastal meadows would be disproportionate to the total area affected. Lastly, lowland vegetation would be the least common vegetation type in terms of total area; however, lowlands are characterized by wetland vegetation, which is sensitive to disturbance and highly regulated (see Section 3.9.2, above, for a discussion of impacts to wetlands).

Impacts to vegetation during the Planning Phase may occur from the following Planning Phase activities and are described below: pedestrian surveys, vegetation clearing, and geotechnical drilling.

Pedestrian surveys for engineering and cultural and environmental resources would affect vegetation through trampling of vegetation. Trampling and compaction from pedestrian surveys would have short-term, minor impacts on vegetation since travel would be on foot and would not be concentrated in any one area for extended periods. Hand excavation of temporary shallow (0.5 by 0.5 by 1 meter) soil test pits would occur which would result in temporary disturbance to soils and vegetation in and directly around the footprint of the excavation. Disturbance would be in the form of severed plant roots and soil compaction from trampling in the immediate area around the excavation. The total number of test pits is unknown at this time and the CIRI Terms and Conditions do not set a limit on how many test pits can be drilled in the easement areas; however, the number of test pits would be limited by the number of field staff and the duration of field surveys, 4–5 people for 10 days for cultural resources and 2–4 for 8 days for engineering surveys, which would constrain the number of test pits to some extent. The CIRI Terms and Conditions require that test pits that do not collapse in upon themselves be backfilled, which would help to mitigate the impacts to soils and vegetation and allow natural revegetation and reduce the potential for erosion. Given the limited duration of field surveys and backfilling requirement, impacts to vegetation from test pits would be short-term, minor, and wet and mesic vegetation and soils at the backfilled test pits would be expected to recover quickly (1–2 years), while dry vegetation (particularly alpine vegetation) would recover more slowly (3–5 years).

During the Planning Phase (specifically, trees and shrubs) would be disproportionately impacted from vegetation clearing compared to herbaceous because trees and shrubs require longer time periods to recover after cutting. Furthermore, herbaceous plants are generally lower growing than woody plants and would not need to be cut to prepare a helicopter landing zone or to construct a drill pad. The Terms and Conditions also do not prohibit creating helicopter landing sites in wetlands or prohibit drilling in wetlands. Wetland vegetation generally occurs in the lowland physiography (such as Lowland Forests and Woodlands) and waterbodies (such as River Water) listed in Table 3-7 and Table 3-8, and impacts from vegetation clearing could occur in these areas.

Geotechnical drilling during the Planning Phase would involve building temporary drill pads, drilling geotechnical boreholes, and managing and disposing of drilling materials. Construction of the drill pad will disturb soil and vegetation under and directly adjacent to the drill pads. Disturbance to vegetation from drill pad construction is discussed above under vegetation clearing. Soil disturbance from drill pad construction would include compaction of soils under and directly adjacent to the drill pad from construction activities and placement of the pad, increased risk of erosion, and drill activities to extract geotechnical cores. Drill pad construction could also result in the introduction of invasive plants into the Park. The CIRI Terms and Conditions include some measures to mitigate the risk of spreading invasive plants, including cleaning equipment, clothing, etc., before entering the Park and follow-up invasive weed surveys at drill sites. While the CIRI Terms and Conditions should mitigate the risk of introducing invasive plant species, the potential still exists for invasive plants to be introduced into the proposed easements. Once introduced, invasive plants are difficult to control and would likely spread to areas outside the easements through the spread of plant propagules by water, wind, and animals (such as seeds attached to fur). The CIRI Terms and Conditions state that drilling materials will not be discharged directly into any standing or flowing water or vegetated areas. However, in the event of an accidental spill or leak of drilling materials, fuel, or lubricants, the CIRI Terms and Conditions do not include mitigation measures (such as secondary containment) and remedial actions (such as a spill response plan) to prevent and address

environmental contamination. Therefore, the risk of contamination and mortality of vegetation would be higher in Option 2 than in Options 3 and 4.

Option 2 overall has less restrictive Terms and Conditions than Options 3 and 4. The less restrictive Terms and Conditions could lead to greater impacts in terms of ground disturbance, compaction, erosion, damage to vegetation, and introduction of exotic invasive species than those estimated for Options 3 and 4.

Phases 2 and 3 – Construction and O&M

The transportation corridor easement would be reduced from 1,000 feet wide during Planning Phase actions to 250 feet wide and 100 feet wide for Construction and O&M, respectively (Table 1-2). Because there are no site-specific designs or plans for Construction and O&M of the port or rail/road, including the alignment of the road/rail, impacts to vegetation cannot be accurately estimated at this time. CIRI has indicated that they would like the large port area for siting purposes and that it will be reduced in later phases; however, the extent of the reduction is not currently known. Once sufficient detail is developed, additional environmental review and permitting, along with development of additional Terms and Conditions for these activities, would occur.

Additional Impacts from Planned Actions

Overall, the impacts of other trends and planned actions that may affect vegetation are described above in the “Current and Expected Future Conditions of the Environment.” As discussed, increasing temperatures related to climate change could lead to drying and loss of wetland vegetation and upward migration of tree line, and tectonic uplift could lead to seaward migration of salt marsh vegetation. Oil and gas development in Cook Inlet could result in degradation to wetland vegetation along coastal areas (specifically, salt marshes) in the event of a leak or spill.

As noted above, the Planning activities could have adverse impacts to vegetation under this option due to the less restrictive Terms and Conditions. There is potential for substantial loss and degradation of vegetation from Construction and O&M within the easement areas. These activities, in addition to the other trends and planned actions, would adversely affect the existing conditions of vegetation.

3.10.2.3 Option 3 – Conveyance of North Transportation Corridor and Hungryman Creek Port Area

Phase 1 – Planning Phase Activities

The Option 3 transportation corridor easement will result in the conveyance of 1,029 acres of vegetation and 22 acres of unvegetated lands, for a total of 1,051 acres (Table 3-7). Upland shrublands and meadows, followed by upland forests and woodlands, are the most abundant vegetation types under this option. These two upland vegetation types are also the most common in the Maritime ecoregion of the Park, encompassing 312,019 acres and 64,247 acres, respectively, across all of the Park (Wells et al. 2013). Lowland shrublands would be the next most dominant vegetation type under this option. This vegetation type includes shrub-dominated wetlands occurring in the Johnson River Valley near where the transportation corridor turns north toward Bear Pass. Riverine shrublands, located on the Johnson River floodplain near the western terminus of the transportation corridor, would be next most impacted under this option. The remaining vegetation types all represent 1 percent or less of the transportation corridor.

The Option 3 port area easement would convey an easement covering 257 acres of vegetation and 7 acres of unvegetated lands for a total of 264 acres (Table 3-8). Riverine forests and woodlands, followed by upland shrublands and meadows are the most abundant vegetation types in this area. Riverine shrublands would be the next most dominant vegetation type subject to the easement conveyed under this option. The riverine vegetation occurs on an alluvial fan of Hungryman Creek and is subject to periodic overbank flooding. Approximately 9 acres of coastal meadows, representing 0.1 percent of coastal meadows in the Park, would be subject to the easement conveyed under this option. Coastal meadows are relatively rare in the Park, representing 0.2 percent (9,884 acres) of the Park (Wells et al. 2013). Thus, any impacts to coastal meadows are disproportionate to the total area affected. Lastly, lowland vegetation would be the least impacted in terms of total area; however, lowlands are characterized by wetland vegetation which is sensitive to disturbance and highly regulated (see the wetlands section, above, for a discussion of impacts to wetlands).

Impacts to vegetation during the Planning Phase may occur from the following Planning Phase activities and are described below: pedestrian surveys, vegetation clearing, and geotechnical drilling.

Pedestrian surveys for engineering and cultural and environmental resources would affect vegetation through trampling of vegetation. Trampling and compaction from pedestrian surveys would have short-term, minor impacts on vegetation since travel would be on foot and would not be concentrated in any one area for extended periods. Hand excavation of temporary shallow (0.5 by 0.5 by 1 meter) soil test pits would occur which would result in temporary disturbance to soils and vegetation in and directly around the footprint of the excavation. Disturbance would be in the form of severed plant roots and soil compaction from trampling in the immediate area around the excavation. The total number of test pits is unknown at this time; however, the number of test pits would be limited by the number of field staff and the duration of field surveys, 4–5 people for 10 days for cultural resources and 2–4 for 8 days for engineering surveys, which would constrain the number of test pits to some extent. The Terms and Conditions require that test pits that do not collapse in upon themselves be backfilled, which would help to mitigate the impacts to soils and vegetation and allow natural revegetation and reduce the potential for erosion. Given the small size of the test pits, limited duration of field surveys, and backfilling requirement, impacts to vegetation from test pits would be short-term, minor, and wet and mesic vegetation and soils at the backfilled test pits would be expected to recover quickly (1–2 years), while dry vegetation (particularly alpine vegetation) would recover more slowly (3–5 years).

During the Planning Phase, vegetation clearing would occur to prepare helicopter landing sites (14 by 14 feet, 0.004 acre each) and temporary drill pads (20 by 20 feet, 0.1 acre each). Under the Terms and Conditions, all ground-disturbing activities occurring during the Planning Phase must not cumulatively exceed 1.5 acres for the transportation corridor and 1 acre for the port area easement. In addition, the number of helicopter landing sites is limited to 20 (0.8 acre total). Therefore, the total area of vegetation that could potentially be cleared is 2.3 acres. The Terms and Conditions also specify that helicopter landing sites will be selected in open areas where brushing is either minimal or not required. Therefore, 2.3 acres is likely an overestimate of the total impacts that would be cleared under Option 3. Woody vegetation (specifically, trees and shrubs) would be disproportionately impacted from vegetation clearing compared to herbaceous because trees and shrubs require longer time periods to recover after cutting. Furthermore, herbaceous plants are generally lower growing than woody plants and would not need to be cut to prepare a helicopter landing zone or to construct a drill pad. The Terms and

Conditions attempt to minimize the impacts to woody vegetation by 1) specifying that helicopter landing sites will be selected in open areas (as discussed above), and 2) restricting the cutting of trees during brushing and restricting brushing to shrub or open (herbaceous) vegetation types. The Terms and Conditions also prohibit creating helicopter landing sites in wetlands and prohibit drilling in wetlands (and hence, no vegetation in wetlands would be cleared to construct drill pads). Wetland vegetation generally occurs in the lowland physiography (such as Lowland Forests and Woodlands) and waterbodies (such as River Water) listed in Table 3-7 and Table 3-8, and no impacts from vegetation clearing would occur in these areas. Due to the Terms and Conditions, vegetation clearing would be limited to just a few vegetation types, of which Upland Shrublands and Meadows is by far the most common in the easements and across the maritime ecoregion of the Park. Impacts from up to 2.3 acres of vegetation clearing to more common vegetation types would be low relative to less common vegetation, for instance, Riverine Shrublands. This is because the area of vegetation cleared relative to the area of less common vegetation represents a larger percentage of the available area of the less common types. Rare plant populations could also be disturbed during vegetation clearing. The Terms and Conditions address the risk to rare plants by stating that CIRI must avoid any ground- or vegetation-disturbing activity at or near any known populations of rare plant species listed by the Alaska Center for Conservation Science.

Geotechnical drilling during the Planning Phase would involve building temporary drill pads, drilling geotechnical boreholes, and managing and disposing of drilling materials. Construction of the drill pad will disturb soil and vegetation under and directly adjacent to the drill pads. Disturbance to vegetation from drill pad construction is discussed above under vegetation clearing. Soil disturbance from drill pad construction would include compaction of soils under and directly adjacent to the drill pad from construction activities and placement of the pad, increased risk of erosion, and drill activities to extract geotechnical cores. Drill pad construction could also result in the introduction of invasive plants into the Park. The Terms and Conditions include several measures to mitigate the risk of spreading invasive plants, including cleaning equipment, clothing, etc., before entering the Park and follow-up invasive weed surveys at drill sites. While the Terms and Conditions should mitigate the risk of introducing invasive plant species, the potential still exists for invasive plants to be introduced into the proposed easements. Once introduced, invasive plants are difficult to control and would likely spread to areas outside the easements through the spread of plant propagules by water, wind, and animals (such as seeds attached to fur). The Terms and Conditions also state that drilling materials will not be discharged directly into any standing or flowing water or vegetated areas. In the event of an accidental spill or leak of drilling materials, fuel, or lubricants, the Terms and Conditions include mitigation measures (such as secondary containment) and remedial actions (such as a spill response plan) to prevent and address environmental contamination. Therefore, the risk of contamination and mortality of vegetation would be low, and in the event that contamination did impact vegetation, the impacts would be short-term and low intensity.

As a result of the Terms and Conditions, impacts to vegetation from the above-described Planning Phase activities would be localized, short-term, and minor for herbaceous vegetation, localized, short- to long-term, and moderate for woody vegetation, and negligible for wetland vegetation. Impacts from invasive plants would be local- to broad-scale, long-term, and moderate. Impacts to soils from drilling would be localized, short-term, and moderate.

Phases 2 and 3 – Construction and O&M

The transportation corridor easement would be reduced from 1,000 feet wide during Planning Phase actions to 250 feet wide and 100 feet wide for Construction and O&M (Table 1-2).

Because there are no site-specific designs for Construction and O&M, the alignment of the road/rail are not known and impacts to vegetation from the transportation corridor cannot be estimated. CIRI has indicated that they would like the large port area for siting purposes and that it will be reduced in later phases; however, the extent of the reduction is not currently known. Once sufficient detail is developed, additional environmental review and permitting, along with development of additional Terms and Conditions for these activities, would occur.

Construction and O&M could result in substantial loss or degradation of vegetation which would most likely be predominantly riverine forests and woodlands, followed by upland shrublands and meadows if the entire easement area were constructed. Once sufficient detail is developed, additional environmental review and permitting, along with development of additional Terms and Conditions for these activities, would be required for Construction and O&M and would consider impacts to vegetation.

Additional Impacts from Planned Actions

Cumulative vegetation impacts from Option 3 would be similar to Option 2; except for Option 3 would have less additive effects due to (1) fewer acres and (2) restrictive Terms and Conditions, compared to Option 2.

3.10.2.4 Option 4 – Conveyance of South Transportation Corridor and Deep Water Port Area

Phase 1 – Planning Phase Activities

The Option 4 transportation corridor easement will result in the conveyance of 980 acres of vegetation and 36 acres of unvegetated lands, for a total of 1,016 acres (Table 3-7). Upland shrublands and meadows are the most dominant vegetation type, followed by upland forests and woodlands, and the areas affected would be approximately the same as under Option 3. These two upland vegetation types are also the most common in the Maritime ecoregion of the Park, encompassing 312,019 acres and 64,247 acres, respectively, across all of the Park (Wells et al. 2013). Lowland and riverine shrublands would be the second and third most dominant under this option and include the same areas under Option 3. The remaining vegetation types all represent 1 percent or less of the transportation corridor.

The Option 4 port area easement would result in conveyance of 540 acres of vegetation and 9 acres of unvegetated lands, for a total of 549 acres (Table 3-8). The greatest impacts would be in upland forests and woodlands, followed by riverine forests and woodlands. The riverine vegetation occurs on the floodplains and alluvial fans of an unnamed creek to the southeast of Bear Creek and are subject to periodic overbank flooding. Upland shrublands and meadows would be the next most impacted under this option. Approximately 16 acres of coastal meadows, representing 0.2 percent of coastal meadows in the Park, would be impacted under this option. Coastal meadows are relatively rare in the Park, representing 0.2 percent (9,884 acres) of the Park (Wells et al. 2013). Thus, any impacts to coastal meadows are disproportionate to the total area affected. Lastly, lowland vegetation would be the least impacted in terms of total area; however, lowlands are characterized by wetland vegetation which is sensitive to disturbance and highly regulated (see the wetlands section, above, for a discussion of impacts to wetlands).

Planning Phase physical impacts to the vegetation would be similar to those described under Option 3.

Phases 2 and 3 – Construction and O&M

Impacts would be the same as described for Option 3, except that the port area under Option 4 would convey an easement covering approximately twice as much area of vegetation than that under Option 3 (Table 3-8). Most of the difference in area between the two options is accounted for by upland forests and woodlands. In addition, Option 4 would open up 7 more acres of coastal meadows for construction than Option 3.

Additional Impacts from Planned Actions

Impacts from Option 4 would be the same as Option 3.

3.10.2.5 Comparative Conclusion of Options

Option 3 would impact the fewest acres (1,286) of vegetation across both the transportation corridors and port areas, followed by Option 4 (1,520 acres) and Option 2 (2,514 acres). Under Options 2, 3, and 4, the vegetation types that would be most impacted in the combined transportation corridors and port areas would be the same, upland shrublands and meadows and upland forests and woodlands; however, the greatest area of impacts of these types would be under Option 2. Coastal meadows would be impacted under the Options 2, 3, and 4 proposed port areas. The acres of coastal meadow impacted under Options 3 and 4 would be approximately the same, with Option 4 slightly greater than Option 3. The Option 2 port area has the potential to impact 10–15 times the area of coastal meadows that would be impacted under Options 3 and 4.

Option 2 overall has less restrictive Terms and Conditions than Options 3 and 4 and could lead to greater impacts in terms of ground disturbance, compaction, erosion, damage to vegetation, and introduction of exotic invasive species than those estimated for Options 3 and 4. Option 2 could result in substantial loss and degradation of vegetation from Planning activities alone. Option 3 and 4 have the same, more restrictive Terms and Conditions. In general, impacts to vegetation from Options 3 and 4 Planning activities would be localized, short-term, and minor in intensity. This is because the disturbance intensity will typically be low, and the extent of vegetation impacted by these activities will typically be small relative to the total extent of the vegetation types across the proposed easements. However, less common vegetation types (such as Coastal Meadows) would be disproportionately impacted were Planning Phase activities to occur in these less common types. In addition, certain Planning Phase activities have the potential to have long-term (such as clearing woody vegetation) and/or moderate (such as soil disturbance from drilling) and/or broad-scale (extending outside the easements) impacts (such as introduction of invasive plants).

Because there are no site-specific designs for Construction and O&M and the alignment of the road/rail and design for the port area are not known, the acreage subject to the easement conveyed and impacts to vegetation cannot be accurately estimated for these phases. The duration, extent, and severity of potential impacts for all options related to Construction and O&M activities cannot be accurately estimated at this time to the absence of design and engineering plans.

3.11 PALEONTOLOGICAL RESOURCES

3.11.1 Current and Expected Future Conditions of the Environment

Most paleontological resources in the Park are found in the Iniskin-Tuxedni region along the coast. This area consists of Jurassic marine sedimentary rocks and volcanic units with numerous

fossils. Fossil-bearing bedrock units crossed by the proposed easements include the Late Jurassic Naknek Formation, the Middle Jurassic Chinitna Formation, the Middle Jurassic Tuxedni Group, and the Early Jurassic Talkeetna Formation.

From oldest to youngest, the Naknek Formation has been divided into the Chisik Conglomerate, an informal lower sandstone member, the Snug Harbor Siltstone, and the Pomeroy Arkose Member. Fossils have not been found in the Chisik Conglomerate in the Park, and fossilized material is rare in the Pomeroy Arkose. The lower sandstone member commonly contains ammonites with abundant bivalves in some localities. The most fossiliferous member of the Naknek Formation is the Snug Harbor Siltstone, which contains many different bivalve species as well as ammonites. No fossil localities have been noted in the Snug Harbor Siltstone within the Park, possibly due to the remote nature of outcrop exposures (Ruga et al. 2020).

The Chinitna Formation is divided into two siltstone members: the lower Tonnie Member and the upper Paveloff Member. In the Tonnie Member, fossilized bivalves, ammonites, echinoids, and belemnite fragments have been found in outcrops near Bear Creek. The Paveloff Siltstone Member is exposed near Tuxedni Bay and contains an assortment of bivalves, belemnites, brachiopods, and gastropods.

A prominent fossil locality in the Tuxedni Group is the Fossil Point site, where the Red Glacier Formation, Fitz Creek Siltstone, and Cynthia Falls Sandstone are exposed. In 2014, an extensive field-based inventory was completed for paleontological resources at Fossil Point (Blodgett et al. 2015). The Red Glacier Formation was found to contain abundant ammonites and numerous thin coquina layers in which bivalves and belemnites are common. Ammonite and bivalve fauna can also be found in the Fitz Creek Siltstone. The Cynthia Falls Sandstone contains fewer fossils, though ammonites and plant fossils have been identified in this unit within the Park.

Fossil Point is located just north of the port area easement on a peninsula that juts out into Tuxedni Bay. The quality of fossils at Fossil Point is well known to the scientific community and the general public, resulting in heavy visitation during the summer months. The ease of access and high volume of visitors make the area prone to illegal fossil collection. The site is also vulnerable to erosion due to strong storms that occur in Cook Inlet and Tuxedni Bay. Because of these factors, NPS has identified Fossil Point as a site that may require future management and monitoring (Lanik et al. 2019; Ruga et al. 2020).

The youngest unit of the Talkeetna Formation, the Horn Mountain Tuff Member, is exposed near the western end of the transportation corridor. It has produced some belemnite and plant fragments, including large tree stumps, well preserved plant fossils, leaf impressions, and fossilized ferns (LePain et al. 2016). Most of these specimens have been found near Horn Mountain southwest of the Project area, but at least one fern fossil has been noted where the Horn Mountain Tuff crops out along a tributary of the Johnson River.

Paleontological resources are protected from disturbance as outlined in the Paleontological Resources Preservation Act (Public Law 111-011). Section 6306(a)(1) of this law states that a person may not, “[...] excavate, remove, damage, or otherwise alter or deface or attempt to excavate, remove, damage, or otherwise alter or deface any paleontological resources located on Federal land [...].”

3.11.1.1 Additional Trends and Planned Actions

Future monitoring and management decisions at Fossil Point could affect how paleontological resources at the site are managed. Per NPS Management Policy (NPS 2006), scientifically important fossils subject to excessive erosion may be preserved through collection or *in situ*

stabilization. Implementing these types of measures at Fossil Point in the future would help protect scientifically important fossils from unauthorized collection.

3.11.2 Environmental Consequences

3.11.2.1 Option 1 – No Action

Impacts of Option 1

Under Option 1, the easements would not be conveyed for either a port or a transportation route and the conditions of ANCSA and the 1976 Act would not be fulfilled. As a result, impacts to paleontological resources would be the same as described above, in the “Current and Expected Future Conditions of the Environment.”

Additional Impacts from Planned Actions

Under Option 1, an easement would not be conveyed and there would be no impacts to paleontological resources; therefore, the environment would remain the same as or similar to the “Current and Expected Future Conditions of the Environment” section. Past, present, and reasonably foreseeable actions and their impacts would be the same as those described in the “Current and Expected Future Conditions of the Environment” section.

3.11.2.2 Option 2 – CIRI’s Initial Proposal

Phase 1 – Planning Phase Activities

Option 2 would also allow Planning Phase activities across the north and south transportation corridors and the full port area easement, potentially increasing access to Fossil Point and the likelihood of unauthorized collection of paleontological resources.

Planning Phase activities that could impact paleontological resources include the construction of helipads, construction of drill pads, and excavation of shallow soil test pits. Each of these activities could expose *in situ* fossils by disturbing native soil and shallow, weathered bedrock. Fossils exposed during ground disturbance could be damaged by wind and water erosion, or crushed by increased foot traffic or equipment driving over the fossil specimens, precluding further study of the resource. Increased risk of damaging subsurface paleontological resources during geotechnical drilling is possible and would be unknown prior to drilling activities, ultimately destroying potential specimens.

The CIRI Terms and Conditions that apply to Option 2 do not contain any specific measures designed to protect paleontological resources and are less restrictive overall than the NPS Terms and Conditions detailed in Section 2.5. This could result in situations where workers uncover fossil specimens without realizing their significance and damage the specimens before reporting the finds to NPS.

Phases 2 and 3 – Construction and O&M

The transportation corridor easement would be reduced from 1,000 feet wide during Planning Phase actions to 250 feet wide and 100 feet wide for Construction and O&M, respectively (Table 1-2). CIRI has indicated that they would like the large port area for siting purposes and that it will be reduced in later phases; however, the extent of the reduction is not currently known. Because there are no site-specific designs or plans for Construction and O&M of the port or rail/road, including the alignment of the road/rail, the duration, extent, and severity of impacts to paleontological resources cannot be accurately estimated at this time. Once sufficient detail is developed, additional environmental review and permitting, along with development of additional Terms and Conditions for these activities, would occur.

However, building and maintaining an access road/rail over Bear Pass and a port area on Tuxedni Channel would still have a greater chance of exposing and damaging paleontological resources compared to the Planning Phase activities. This impact would occur regardless of whether the north or south transportation corridor is used for the new road or rail line. Construction-related impacts could be mitigated through Terms and Conditions for paleontological monitoring to help identify and report any fossils encountered before accidental damage occurs.

Constructing a new road/rail and port area would also permanently increase access to the Project area. The Fossil Point locality just north of the port area easement is already heavily visited in the summer months and is prone to unauthorized fossil collection. Building a new port in this area would make access to Fossil Point easier, potentially increasing fossil collection and damage to this paleontological feature. If a new road is constructed in the transportation corridor (instead of a rail line), and the road surface is left in a natural state, the road could be subject to erosion from storms in Cook Inlet and Tuxedni Bay that might expose *in situ* fossils.

Additional Impacts from Planned Actions

As noted above, NPS has identified Fossil Point as a site that may require future management and monitoring (Ruga et al. 2020). NPS Management Policy allows scientifically important fossils to be preserved through collection or *in situ* stabilization (NPS 2006). If management and monitoring are implemented for Fossil Point in the future, it would help limit additional impacts from increased access to the site caused by Construction and O&M activities in the transportation and port area easements.

3.11.2.3 Option 3 – Conveyance of North Transportation Corridor and Hungryman Creek Port Area

Phase 1 – Planning Phase Activities

Impacts to paleontological resources from Planning Phase activities would be similar to Option 2 but would be lower under Option 3 because the NPS Terms and Conditions are more restrictive. The NPS Terms and Conditions include conducting a pre-ground disturbance paleontological survey (anticipated for spring 2025), providing the survey report findings to CIRI with recommendations on how best to manage potential resource impacts. This type of pre-disturbance survey would allow CIRI to develop strategies to mitigate paleontological resource impacts, such as siting helipads and drill pads away from sensitive resource sites.

Under the NPS Terms and Conditions for Option 3, CIRI may also need to provide a paleontological monitor for ground-disturbing activities. Having a paleontological monitor on site would help ensure rapid identification and reporting of any finds to NPS, thereby avoiding accidental damage to fossils uncovered during the Planning Phase work.

Phases 2 and 3 – Construction and O&M

Impacts would be the same as described for Option 2.

Additional Impacts from Planned Actions

Compared to Option 2, the potential for additional impacts would be lower under Option 3 because this option includes the NPS Terms and Conditions designed to protect paleontological resources.

3.11.2.4 Option 4 – Conveyance of South Transportation Corridor and Deep Water Port Area

Phase 1 – Planning Phase Activities

The types of paleontological resource impacts expected under Option 4 would be the same as Option 3. However, northeast of Bear Pass, the location of potential impacts would shift to the south transportation corridor along the east bank of Bear Creek. The port area easement would also shift farther to the south to the Deep Water easement location. The south transportation corridor and Deep Water easement are farther from Fossil Point; thus, Planning Phase activities in these areas would not promote access to the Fossil Point locality to the same extent as Option 3. Therefore, implementing Option 4 would likely achieve better protections for sensitive paleontological resources.

Phases 2 and 3 – Construction and O&M

Impacts would be the same as described under Options 2 and 3, but with lower potential impacts due to the Project area moving away from the Fossil Point locality.

Additional Impacts from Planned Actions

Cumulative paleontological resource impacts from Option 4 would be the lowest of the three action options because Option 4 would shift Planning Phase activities and future development farther away from Fossil Point.

3.11.2.5 Comparative Conclusion of Options

Under Option 1, there would be no new effects to paleontological resources in the Project area, and the Park would continue to be managed as it is currently.

Options 2, 3, and 4 have the potential for two main types of paleontological resources impacts during Planning Phase:

- Damage to fossils uncovered during ground disturbing activity due to increased vehicle and foot traffic, and exposure of the specimens to wind and water erosion
- Unauthorized fossil collection resulting from increased access to Fossil Point

Overall, these types of impacts would be least likely under Option 4 because Planning Phase activities would be limited to the southern transportation corridor and the Deep Water port area easement, which are farther from Fossil Point and would not promote access to this locality to the same degree as Options 2 and 3. Option 4, as well as Option 3, also includes specific Terms and Conditions designed to protect paleontological resources.

Potential damage to paleontological resources would be highest under Option 2, because it does not include any Terms and Conditions designed to protect paleontological resources and it could increase chances of unauthorized fossil collection by allowing access to fossil point.

3.12 VISITOR USE AND EXPERIENCE

3.12.1 Current and Expected Future Conditions of the Environment

Lake Clark National Park and Preserve is located off the road system and is remote, undeveloped, and vast. The Park offers views of volcanoes, snow-covered mountains, vast expanses of tundra and forests, wildlife, and free-flowing lakes and rivers that bring visitors from all over the world. The Park manages one of the largest wilderness areas in the United

States, offering visitors opportunities for solitude, quietness, and wild landscapes. Access to the Park is possible via float plane into remote lakes, wheeled plane into Port Alsworth, or on the coastal beaches via boat or plane along the 126 miles of the Park’s Cook Inlet coastline (NPS 2014a).

The majority of visitors in the Park are commercially supported by a lodge, guiding service, or air or water taxi operator. The Park is used for a variety of recreational activities by visitors year-round, including bear viewing, hiking, camping, backpacking, hunting, fishing, and backcountry skiing. Visitation to the Park in 2022 was approximately 18,000 visitors, with 69 percent being day trips (Yogerst 2023). While visitor counts for the Johnson Tract easement areas are not available, Table 3-9 depicts the number of visitors to the Park from 2019 through 2023 (NPS 2024d). Visitation has increased on the Park coast over the last decade, except in 2020, which saw a drop in visitors due to the COVID-19 pandemic. The largest number of visitors arrive during summer months, from June to September (NPS 2024e). Along with increasing numbers of annual visitors, the Park has seen a commensurate increase in the number of visitor use days. A visitor use day is defined as the total number of people (including guides for guided groups) multiplied by the number of days at a location.

Table 3-9. Annual Lake Clark National Park and Preserve Visitors

Year	Recreation Visits
2019	17,157
2020	4,948
2021	18,278
2022	18,187
2023	16,728

Source: NPS 2024d

Two of the most highly visited areas in the Park are the coastal areas Chinitna Bay and Silver Salmon Creek. Chinitna Bay is located south of the Project area, at the southeastern edge of the Park. The closest high-use area is Silver Salmon Creek, which includes the Johnson River at its northern boundary (NPS 2024e). Since 2009, visitation at Silver Salmon Creek has gone from around 700 annual visitors to 3,000 annual visitors in 2022. Visitor use days during that same period have gone from almost 1,700 in 2009 to over 6,300 in 2022. In 2022, approximately 16.5 percent of all visitors to the Park visited Silver Salmon Creek.

Waterways in the Project area support salmon runs (Hungryman Creek and Bear Creek) and may be locations for recreational fishing; Johnson River also supports salmon runs, with guided sport fishing reported by commercial operators (NPS unpublished data, n.d.-g). Clamming is reported to occur in Tuxedni Bay north of Fossil Point and near Polly Creek. Setnetting, which is a type of passive fishing where nets are anchored in place to snag passing fish, occurs within Tuxedni Channel with several sites located off Chisik Island. Commercial visitation reported at Tuxedni Bay visitor use area is increasing, and data on how much non-commercially supported visitation is occurring from visitors who access the area is not available.

Concerns regarding bear viewing was mentioned by numerous commentors during the civic engagement period for this Project (Section 4.1, Civic Engagement). Bear viewing opportunities are most common along the coast of the Park, including areas around Silver Salmon Creek, with some use occurring on the Johnson River. In 2022, 18 commercial operators originating from Homer, Kenai, Soldotna, and Anchorage reported a combined total of 3,000 bear viewing visitor

use days in Silver Salmon Creek. Almost all of the businesses offering bear viewing services are locally owned and operated (Young and Little 2019). In 2024, 66 commercial operators held a commercial use authorization for bear viewing services. Commercial operators reported a combined total of over 12,000 bear viewing visitor use days in 2023 along the entire coast (NPS unpublished data, n.d.-g). Using the average cost per trip, this generates over \$11 million per year in economic activity for bear viewing operators and is expected to rise to at least \$13 million in 2026 (Ehrenpreis and Kao 2021).

Four cabin sites are located in the port area easement (Deep Water), as shown on Figure 3-4. Cabins LACL-246 and LACL-247 on Figure 3-4 are on Park land but predate the formation of Lake Clark National Park. These sites are occupied by residents in the summer and have been historically—but not exclusively—used for setnetting. Cabins LACL-063 and LACL-010, which were historically used as summer-use setnetting support sites, are also on Park land but are unoccupied and show signs of disrepair. LACL-243 and LACL-244 are located outside of the Project easement areas. One cabin just south of the port area easement is privately owned and not on Park or federal property (labeled as “Privately Owned Cabin” on Figure 3-4)(NPS 2024f; Schwaderer 2024). Additionally, approximately five cabins are located on the northern tip of Chisik Island, but the exact number and their use are unknown. The Chisik Island cabins are not located on NPS land (Figure 3-4).

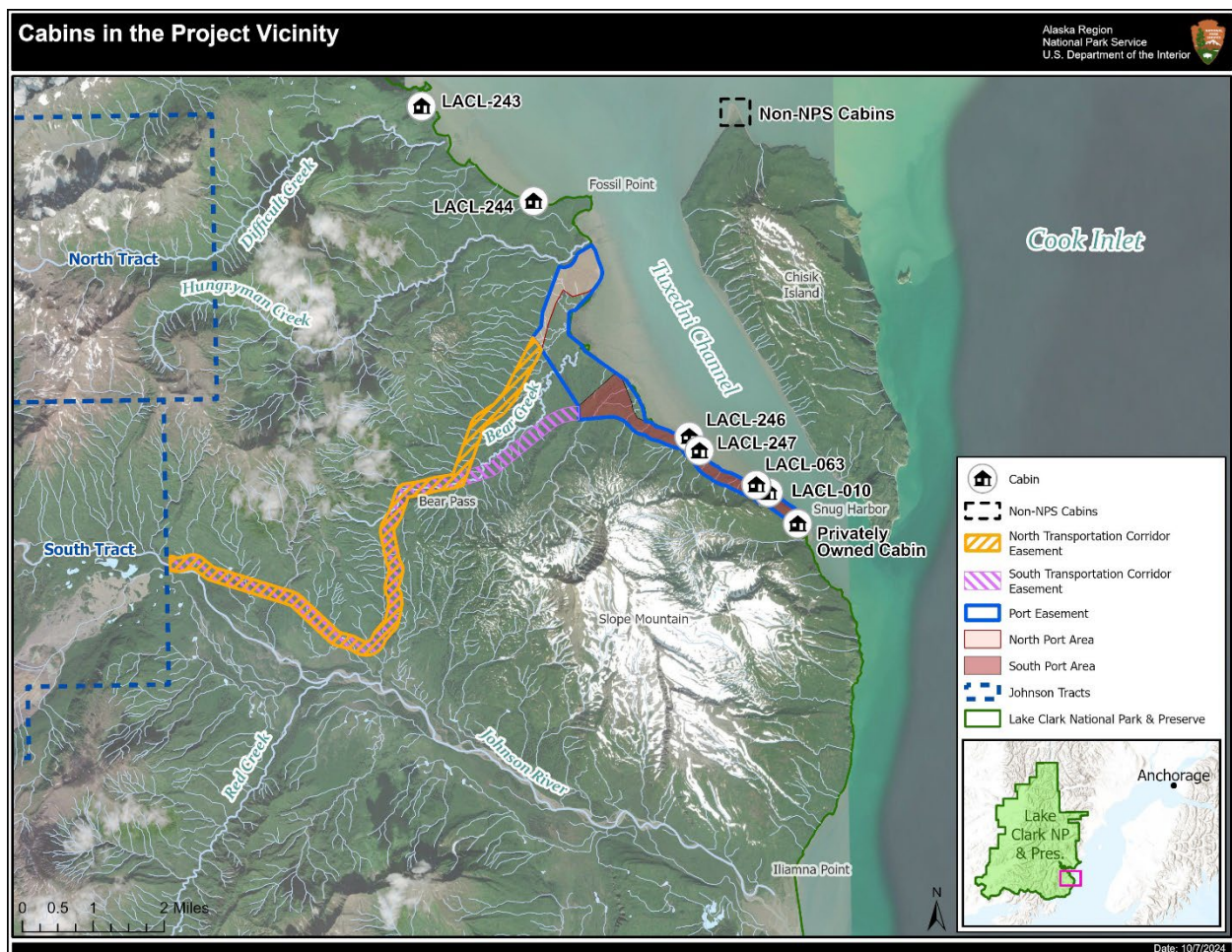


Figure 3-4. Cabins Located within the Project Vicinity

There are several lodges that are located within the Park or in the vicinity of the Project area. These lodges are discussed in detail in Section 3.16, Socioeconomics, and shown on Figure 3-5, but offer guided wildlife photography tours, sport fishing, boat tours, bear and wildlife viewing, and a variety of other activities and excursions in and near the Park. The lodges that are closest to the Project area are Silver Salmon Creek Lodge and the Alaska Homestead Lodge, which are located south of the Johnson River and near the coastline and Silver Salmon Creek, and Snug Harbor Outpost, which is located across Tuxedni Channel on Chisik Island.

3.12.1.1 Additional Trends and Planned Actions

As part of the Cook Inlet Planning Area Oil and Gas Lease Sale 258 (which took place December 30, 2022), there is potential for oil and gas exploration and development in Cook Inlet; however, a July 2024 judicial ruling suspended the lease sale (U.S. District Court of Alaska Case No. 3.22-cv-00279-SLG). It is unclear if the lease sale will be permitted at this time. If this lease were developed, impacts could occur to visitor use and experience from increased noise from oil and gas activities, including drilling and increased presence of aircraft and vessels in the area. A leak of contaminants or a spill along the coastline and around Chisik Island could also lead to a change in attendance or enjoyment of the Park. There are no additional trends or planned actions that would impact visitor use and experience in the Project area. NPS is currently in the process of updating the Coastal Management Plan, which is intended to improve visitor experience at key coastal sites. Otherwise, the Park and the surrounding areas would continue to be managed in ways similar to current conditions.

3.12.2 Environmental Consequences

3.12.2.1 Option 1 – No Action

Impacts of Option 1

Under Option 1, the easements would not be conveyed for either a port or a transportation route and the conditions of ANCSA and the 1976 Act would not be fulfilled. As a result, impacts to visitor use and experience would be the same as described above, in the “Current and Expected Future Conditions of the Environment.”

Additional Impacts from Planned Actions

Under Option 1, an easement would not be conveyed and there would be no impacts to visitor use and experience; therefore, the environment would remain the same as or similar to the “Current and Expected Future Conditions of the Environment” section. Past, present, and reasonably foreseeable actions and their impacts would be the same as those described in the “Current and Expected Future Conditions of the Environment” section.

3.12.2.2 Option 2 – CIRI’s Initial Proposal

Phase 1 – Planning Phase Activities

Visitors to the area may encounter other humans during the pedestrian and geotechnical surveys, although the number of people expected for survey activity would not be large. Option 2 would impact visitors to the two cabins north of the Hungryman Creek port area easement and the five cabins (two of which are non-owner occupied and one of which is privately owned and not on NPS land) located near the Deep Water port area easement. However, access to these cabins may be limited, requiring NPS to authorize the use of the easement area by the public during periods such as when barges are in the area and equipment is being moved to the easement areas, but access is not expected to be denied during the Planning Phase. Visitors may

notice an increase from current aviation noise due to the presence of helicopters as well as potential impacts to the soundscape made by drilling noise from the geotechnical surveys.

Phases 2 and 3 – Construction and O&M

The transportation corridor easement would be reduced from 1,000 feet wide during Planning Phase actions to 250 feet wide and 100 feet wide for Construction and O&M, respectively (Table 1-2). CIRI has indicated that they would like the large port area for siting purposes and that it will be reduced in later phases; however, the extent of the reduction is not currently known. Because there are no site-specific designs or plans for Construction and O&M of the port or rail/road, including the alignment of the road/rail, the duration, extent, and severity of impacts to visitor use and experience cannot be accurately estimated at this time. Once sufficient detail is developed, additional environmental review and permitting, along with development of additional Terms and Conditions for these activities, would occur.

The easements will be amended both at the Construction and O&M Phases and access to the public may change when that occurs. Broadly, visitor access within the easement areas is anticipated to be restricted during the Construction and O&M Phases due to health and safety as well as operational concerns. Restricting access has potential to impact visitor experience along the coastline, near Chisik Island, and Tuxedni Channel where recreational fishing, clamming, bear and wildlife viewing, and other activities occur in the easement areas. Additionally, these phases may disrupt or displace wildlife which could be disruptive to visitor activities. Additionally, the noise, presence of vehicles/boats, and operations of the road/rail and industrial port could adversely impact visitor experience.

Additional Impacts from Planned Actions

Option 2 combined with planned activities such as the potential for future oil and gas development could increase the presence of humans and human-induced noise in the Project area. NPS is currently in the process of drafting a Coastal Management Plan, which is intended to improve visitor experience at key coastal sites. Due to the current low visitor numbers to Tuxedni Bay, the plan is not anticipated to have a notable impact on visitor use and experience.

3.12.2.3 Option 3 – Conveyance of North Transportation Corridor and Hungryman Creek Port Area

Phase 1 – Planning Phase Activities

The impacts of Option 3 would be similar to impacts to visitor use and experience for Option 2. Visitors may notice an increase from current aviation noise due to the presence of helicopters as well as potential impacts to the soundscape made by drilling noise from the geotechnical surveys. Two cabins are located north of the Hungryman Creek port area. However, access to these cabins may be limited, requiring NPS to authorize the use of the easement area by the public during periods such as when barges are in the area and equipment is being moved to the easement areas, but access is not expected to be denied during the Planning Phase.

Phases 2 and 3 – Construction

Impacts would be the same as described for Option 2. Additional Impacts from Planned Actions

Impacts would be the same as described for Option 2.

3.12.2.4 Option 4 – Conveyance of the South Transportation Corridor and Deep Water Port Area

Phase 1 – Planning Phase Activities

The impacts of Option 4 would be similar to impacts to visitor use and experience for Option 2 and 3. Option 4 would impact visitors to the five cabins (two of which are non-owner occupied and one of which is privately owned and not on NPS land) located in or near the Deep Water port area easement. Access to these cabins may be limited, requiring NPS to authorize the use of the easement area by the public during periods such as when barges are in the area and equipment is being moved to the easement areas, but access is not expected to be denied during the Planning Phase. Visitors to the area may encounter other humans and an increase in noise from the presence of helicopters, barges, and drilling equipment during Planning activities.

Phases 2 and 3 – Construction and O&M

Impacts would be the same as described for Option 2.

Additional Impacts from Planned Actions

Impacts would be the same as described for Option 2.

3.12.2.5 Comparative Conclusion of Options

Under Option 3, there would be a small impact to visitor use and experience. Impacts would be greater during the Construction and O&M of the road/rail and port. There are two cabins north of the Hungryman Creek port area. Access to these cabins may be limited but is not expected to be denied. Under Option 4, impacts would be similar to Option 3. Five cabins are located within the Deep Water port area. Impacts to this area would be the same as Option 2. Under Option 2, impacts would be similar to Options 3 and 4, but would occur over a greater area, which could increase the extent and intensity of impacts to visitor use and experience. The type and duration of impacts under Option 2 would be the same as for Options 3 and 4.

3.13 SUBSISTENCE

3.13.1 Current and Expected Future Conditions of the Environment

Many Alaskans live off the land and rely on fish, wildlife, and other wild resources; a part of the purpose of the Park is to provide opportunities for traditional subsistence uses. Subsistence is a fundamental value and primary use of the Park (NPS 2014b). ANILCA Section 803 defines subsistence uses as the “customary and traditional” uses of wild resources (ADFG 2024d).

ANILCA authorizes subsistence use within the Park and on other federal public lands in Alaska where specifically permitted. Overall use of the area for subsistence harvest is not well documented; however, to the best of NPS knowledge there is a low level of subsistence use of the area. The area is open for federal subsistence use. The region’s primary subsistence resources are clams, sockeye salmon, caribou, moose, Dall sheep (*Ovis dalli*), brown bear, black bear, migratory and upland game birds, small mammals such as snowshoe hare, furbearing animals, berries, various plants, and dead and live trees for construction and firewood. To engage in subsistence activities within the Park, individuals must either live inside the Park, live in one of the Park’s six designated resident zone communities, or have a subsistence use permit issued by the Park superintendent. Iliamna, Lime Village, Newhalen, Nondalton, Pedro Bay, and Port Alsworth are designated resident zone communities (36 CFR 13.1602) for the Park (NPS 2014b). The Project area is not within a designated resident zone community. These

communities are all located on the west side of the Chigmit Mountains, a subunit of the Aleutian Mountains. The Project area is on the east side of the mountain range. There is no practical non-aviation-based access from the west side to the east side of the mountains. For this reason, there is no known current federal subsistence use of the proposed Project area.

While not resident zone communities, many Tribes in the Cook Inlet region have ancestral ties to the Project area, including, but not limited to, the Ninilchik Village Tribe, the Kenaitze Tribe, the Native Village of Tyonek, and the Seldovia Village Tribe. Information on where these Tribes practice subsistence activities near the proposed Project area is unavailable.

The 2016 State of the Park Report assessed the condition and trend of subsistence resources, including the use of timber, hunting, fishing, and trapping of wildlife, gathering of medicinal and edible plants, and management of subsistence activities. At the time of the report, there was moderate concern for the deteriorating condition of timber use. There are no reporting requirements or restrictions on the amount of firewood cut. A 1999 report suggests 21 cords of birch is the sustainable limit that may be harvested on an annual basis from the Port Alsworth “wood lot.” At the time of the report, subsistence firewood harvest throughout the rest of Lake Clark area and Lake Clark National Park and Preserve was at sustainable levels, with chainsaw permits having doubled from the previous 5 years (NPS 2016).

The Park falls within GMUs 9A, 9B, 16B, 17B, 19B, and 19C. The Project site is entirely located within GMU 9A. The majority of subsistence activities take place outside of the Project area and in GMU 9B due to the location of resident zone communities on the western side of the Park. There would be no impacts to subsistence in GMU 9B due to the distance from the Project area (ADFG 2024e). At the time of the 2016 State of the Park Report, conditions for hunting, fishing, and trapping of wildlife were good and unchanging. Subsistence harvest of Dall sheep in GMU 9B is restricted to five rams (3/4 curl or greater). 2014 was the first year since the sheep quota was implemented that five Dall sheep rams were harvested. Subsistence harvest has averaged less than one ram per year since 2010. Brown bears are also harvested in the Park, and subsistence harvest has averaged less than one bear per year since 2005. There are no federal harvest reporting requirements for moose. Anecdotal reports suggest harvest averages less than two moose per year in GMU 9B. Estimated subsistence sockeye salmon harvests from the Kvichak River watershed on the western side of the Park for the period 1985–2020 average an estimated 50,737 sockeye salmon (Jones and Neufeld 2022). The average annual harvest from 2011–2020 was 34,798 salmon. The number of permit holders has remained somewhat steady, with fewer fish being harvested. Since 2017, the number of sockeye salmon per permit has remained below 146, with a record low of 134 sockeye salmon per permit in 2019. The Kenaitze Indian Tribe has reported that the clam beds in Tuxedni Bay have been historically an important subsistence resource that is still harvested by their members (Kenaitze Indian Tribe 2024).

Local knowledge suggests that reduced success in gathering of plants including berries are due to climate change. No known studies have been conducted for adequate baseline inventory of the effects of climate change on plant resources and impacts on subsistence users. At the time of the report, there was moderate concern for the deteriorating conditions of medicinal and edible plants subsistence harvest (NPS 2016).

The 2024 ANILCA Section 810 analysis (Appendix B) identified concerns from Kenaitze Indian Tribe regarding clam beds in Tuxedni Bay utilized for subsistence activities. However, the analysis found that Planning Phase activities would not significantly restrict current subsistence use in the Project area. There are no other lands outside of the Tuxedni Bay area suitable to

achieve the purposes of this Project, which is to convey a transportation easement and a port easement to CIRI per the conditions of the 1976 Act.

3.13.1.1 Additional Trends and Planned Actions

There are no additional trends or planned actions that would impact subsistence in the Project area aside from those previously described “Additional Trends and Planned Actions” for aquatic resources, wildlife, and vegetation (see Sections 3.3, 3.4, and 3.10). In summary, the Cook Inlet Planning Oil and Gas Lease Sale 258 could result in impacts to coastal subsistence resources through (1) increased human presence in the area and (2) accidental release of contaminants or spills. Additionally, increasing temperatures along and tectonic lifting could change the distribution of and reduce the availability of subsistence resources.

There are no plans for other management changes in the proximity of the Project that would impact subsistence resources. The Park and the surrounding areas would continue to be managed in ways similar to current conditions.

3.13.2 Environmental Consequences

3.13.2.1 Option 1 – No Action

Impacts of Option 1

Under Option 1, the easements would not be conveyed for either a port or a transportation route and the conditions of ANCSA and the 1976 Act would not be fulfilled. As a result, impacts to subsistence would be the same as described above, in the “Current and Expected Future Conditions of the Environment.”

Additional Impacts from Planned Actions

Under Option 1, an easement would not be conveyed and there would be no impacts to subsistence; therefore, the environment would remain the same as or similar to the “Current and Expected Future Conditions of the Environment” section. Past, present, and reasonably foreseeable actions and their impacts would be the same as those described in the “Current and Expected Future Conditions of the Environment” section.

3.13.2.2 Option 2 – CIRI’s Initial Proposal

Phase 1 – Planning Phase Activities

As described in Section 3.4.2, Option 2 has the least restrictive Terms and Conditions to avoid impacts to wildlife. Most wildlife species would be unaffected by the proposed pedestrian surveys, and any temporary changes in behavior would likely return to baseline conditions when surveys are completed. Moose, bear, shorebirds, and passerine birds would likely avoid the areas where surveyors are present.

Use of helicopters has the potential to disturb wildlife in the easement areas and beyond. These impacts could include avian species avoiding the area. The clearing of vegetation for the creation of landing pads is unlikely to directly impact large terrestrial animals or other subsistence resources. The less restrictive Terms and Conditions for activities such as helicopter/flight operations and vegetation clearing could result in adverse effects avian species due to flushing, stress, and nest abandonment. There are no Terms and Conditions for storage of attractants or helicopter/flight operations which could result in increased adverse effects to terrestrial mammals.

As described in Section 3.10.2, Planning Phase activities combined with the less restrictive Terms and Conditions could lead to erosion, soil compaction, contamination from spills, and ground disturbance resulting in adverse impacts to vegetation.

Aquatic resources (Section 3.3.2) could be adversely impacted by the planning phase activities under Option 2 due to the less restrictive Terms and Conditions impacting the quality and quantity of habitat available. As many wildlife species rely on aquatic resources, this could lead to additional adverse impacts to wildlife.

As described in Appendix B, during the Planning Phase, the NPS may use the Transportation Easement and Port Easement Areas or authorize the use by the public so long as such use is compatible and consistent with the Transportation and Port Easements. This right does not permit the NPS, the public, or any other party to interfere with CIRI's reasonable use of the Transportation Easement and Port Easement Areas.

In summary, the less restrictive Terms and Conditions associated with this Option could adversely impact the availability and abundance of subsistence resources. Access to those resources during Planning Phase is not expected to be limited (see Appendix B).

Phases 2 and 3 – Construction and O&M

The eventual construction of a port and road/rail could impact the availability and abundance of subsistence resources. The easements will be amended both at the Construction and O&M Phases and access to the public may change when that occurs. Currently NPS anticipates access within the easement areas to be restricted during the Construction and O&M Phases due to health and safety as well as operational concerns. As described under aquatic resources, wildlife, and vegetation, these resources may be impacted by Construction and O&M of the transportation corridor and port (Sections 3.3, 3.4, and 3.10). As many wildlife species rely on aquatic and vegetation resources, development in the easement areas may result in impacts to subsistence resources. Subsistence resources could be disturbed by Construction and O&M activities and move away from the area which would then affect harvest for users. Additional Impacts from Planned Actions

Planned activities such as the potential for future oil and gas development may impact access to subsistence harvest areas and resources. As part of the Cook Inlet Planning Area Oil and Gas Lease Sale 258, there is potential for oil and gas exploration and development in Cook Inlet (should the lease sale continue). Most subsistence resources within the easement areas would be unlikely to be impacted by offshore oil and gas exploration. However, subsistence resources that are associated with nearshore or tidal areas may be impacted by any decrease in water quality that may result from oil and gas exploration. The construction of a port for the Project would increase the amount of industrial activity, vessel operation, and shipping activities within Cook Inlet, and these effects would be additive to similar effects produced by oil and gas exploration. This may increase the potential for spills or cause an increase in underwater noise and human disturbance, potentially impacting subsistence resources in the region.

In summary, the actions and less restrictive Terms and Conditions associated with this Option, in addition to additional trends and planned actions would adversely affect subsistence resources along coastal areas. The development of a permanent port and transportation corridor could exacerbate stressors on subsistence resources experiencing the effects of climate change.

3.13.2.3 Option 3 – Conveyance of North Transportation Corridor and Hungryman Creek Port Area

Phase 1 – Planning Phase Activities

Impacts would be similar to those described for Option 2; however, with the more restrictive NPS Terms and Conditions we would expect negligible impacts to these resources.

Phases 2 and 3 – Construction and O&M

Impacts would be the same as described for Option 2.

Additional Impacts from Planned Actions

Impacts would be the same as described for Option 2. However, due to the more restrictive Terms and Conditions, Planning Phase activities under this Option are unlikely to be additive to climate change due to their temporary nature. The development of a permanent port and transportation corridor could exacerbate stressors on subsistence resources experiencing the effects of climate change.

3.13.2.4 Option 4 – Conveyance of South Transportation Corridor and Deep Water Port Area

Phase 1 – Planning Phase Activities

Impacts would be the same as described for Option 3.

Phases 2 and 3 – Construction and O&M

Impacts would be the same as described for Option 2.

Additional Impacts from Planned Actions

Impacts would be the same as described for Option 3.

3.13.2.5 Comparative Conclusion of Options

Option 2 would have the greatest impacts to subsistence resources due to the less restrictive Terms and Conditions. Under Options 3, and 4, there would be no long-term impacts to subsistence resources. During Planning activities, most wildlife species would be unaffected. The clearing of vegetation is anticipated to be low and temporary. Access to subsistence resources and activities is not anticipated to be denied during the Planning Phase. Currently NPS anticipates access within the easement areas to be restricted during the Construction and O&M Phases due to health and safety as well as operational concerns, which would result in reduced access to subsistence resources.

3.14 HEALTH AND HUMAN SAFETY

3.14.1 Current and Expected Future Conditions of the Environment

Due to the remote and isolated location of the Park, there is inherent risk to human health and safety. Hazards to humans include wildlife and other natural phenomena, natural disasters, and events. The closest hospital is South Peninsula Hospital in Homer, Alaska, approximately 65 air miles away. There is no cellular phone service in this section of the Park, and emergency services are very limited. NPS encourages visitors, researchers, and other staff to be self-sufficient and prepared to self-rescue when traveling in areas without cellular phone reception. NPS offers an emergency assistance line to report missing persons or request emergency assistance. The Park

coordinates with the Air National Guard Alaska Rescue Coordination Center for search and rescue operations (NPS 2024g).

Additional Trends and Planned Actions

There are no additional trends or planned actions that would impact health and human safety in the Project area. There are no plans for other management changes in the proximity of the Project that would impact health and human safety. The Park and the surrounding areas would continue to be managed in ways similar to current conditions.

3.14.2 Environmental Consequences

3.14.2.1 Option 1 – No Action

Impacts of Option 1

Under Option 1, the easements would not be conveyed for either a port or a transportation route and the conditions of ANCSA and the 1976 Act would not be fulfilled. As a result, impacts to health and human safety would be the same as described above, in the “Current and Expected Future Conditions of the Environment.”

Additional Impacts from Planned Actions

Under Option 1, an easement would not be conveyed and there would be no impacts to health and human safety; therefore, the environment would remain the same as or similar to the “Current and Expected Future Conditions of the Environment” section. Past, present, and reasonably foreseeable actions and their impacts would be the same as those described in the “Current and Expected Future Conditions of the Environment” section.

3.14.2.2 Option 2 – CIRI’s Initial Proposal

Phase 1 – Planning Phase Activities

The impacts of Planning Phase activities on health and human safety in the Park are low. Most survey work would be completed via walking through the easement areas while collecting data. During the pedestrian and geotechnical surveys there would be a slight increase in people in remote areas of the Park. The increase in people would cause a slight increase in risk of bear and other wildlife encounters. If a field crew encounters a freshly excavated bear den or a bear denning, work in the area may only continue if a minimum separation distance of 1 kilometer can be maintained. This distance would limit bear disturbance and minimize the chance for a negative human-bear encounter.

To allow safe egress and ingress in the Project area in the event of a critical incident, helipad locations would be established to expedite evacuation and reduce the risks to health and human safety.

Phases 2 and 3 – Construction and O&M

During the Construction and O&M of the road/rail and port, there is the potential for impacts on human health and safety due to the increase of people in remote areas. Construction and O&M activities would be required to follow Alaska Occupational Safety and Health and Federal Occupational Safety and Health Administration standards. By incorporating these standards, it is expected work conditions would be safe and legal. The easements will be amended both at the Construction and O&M Phases and access to the public may change when that occurs. Broadly, visitor access within the easement areas is anticipated to be restricted during the Construction and O&M Phases due to health and safety as well as operational concerns.

Additional Impacts from Planned Actions

There would be no impacts to health and human safety from planned actions.

3.14.2.3 Option 3 – Conveyance of North Transportation Corridor and Hungryman Creek Port Area

Impacts would be the same as described for Option 2.

Phase 1 – Planning Phase Activities

Impacts would be the same as described for Option 2.

Phase 2 and 3 – Construction and O&M

Impacts would be the same as described for Option 2.

Additional Impacts from Planned Actions

Impacts would be the same as described for Option 2.

3.14.2.4 Option 4 – Conveyance of South Transportation Corridor and Deep Water Port Area

Phase 1 – Planning Phase Activities

Impacts would be the same as described for Option 2.

Additional Impacts from Planned Actions

Impacts would be the same as described for Option 2.

3.14.2.5 Comparative Conclusion of Options

Under Options 2, 3, and 4, there would be a small impact to human health and safety. Impacts would be greater during the Construction, and O&M of the road/rail and port than during Planning Phase activities. During surveys, there would be a slight increase in humans in the remote areas of the Park.

3.15 ENVIRONMENTAL JUSTICE

3.15.1 Current and Expected Future Conditions of the Environment

The U.S. Environmental Protection Agency defines Environmental Justice as “the just treatment and meaningful involvement of all people, regardless of income, race, color, national origin, Tribal affiliation, or disability, in agency decision-making and other Federal activities that affect human health and environment” (EPA 2024). Environmental justice communities of concern (populations with unusually high concentrations of poverty or meaningfully greater concentrations of minorities) should not bear a disproportionate burden of harmful environmental consequences due to policies, programs, activities, or standards, and should be considered in and involved with the environmental decision-making process.

The Park has six resident zone communities: Iliamna, Lime Village, Newhalen, Nondalton, Pedro Bay, and Port Alsworth. The Park Field Headquarters and visitor contact station are located in Port Alsworth, which is approximately 58 miles from the Project site; Iliamna is located approximately 84 miles south of the Project site; Pedro Bay is located approximately 57 miles south of the Project site; Nondalton is located approximately 77 miles south of the Project site; Newhalen is located approximately 84 miles south of the Project site; and Lime

Village is located approximately 124 miles northeast of the Project site. The majority of residents in these villages are Dena'ina, while Newhalen is traditionally Yup'ik (NPS 2020b).

Many Tribes in the Cook Inlet region have ancestral ties to the Project area, including, but not limited to, the Ninilchik Village Tribe, the Kenaitze Tribe, the Native Village of Tyonek, and the Seldovia Village Tribe. Dena'ina Athabascans arrived in the Tikatnu (Cook Inlet) region in the past 1,000 to 5,000 years (Unrau Report 1994). Archeological evidence suggests that before arrival of the Dena'ina, a cultural group of the "Kachemak Tradition" occupied most of Cook Inlet with sites dating between 1,000 and 3,800 years ago (Stanek 2006). This included sites within Tuxedni Bay that demonstrate a subsistence life focused on coastal marine mammals, migratory waterfowl, intertidal resources, and ocean fish. While not resident zone communities, Anchor Point, Homer, Kenai, Ninilchik, Seldovia and Tyonek are included in this RA (Table 3-10).

CIRI, Tyonek Native Corporation, Knikatu Inc., Ninilchik Native Association, Seldovia Native Association, and Chickaloon Moose Creek Native Association own land in or near Tuxedni Bay or have traditional and cultural ties to the area.

The Council on Environmental Quality guidance identifies a "minority population" as one where the percentage of minorities, with respect to race, exceeds 50 percent, or where the percentage of minorities is meaningfully greater than in the general population of the larger surrounding area (CEQ 1997).

The U.S. Census Bureau identifies a "poverty area" as one where 20 percent or more of the residents have incomes below the poverty threshold (U.S. Census Bureau 2023). Table 3-10 shows the selected characteristics and minority population for the local communities.

Table 3-10. Selected Socioeconomic Characteristics for the Local Communities

Community	Population	Population Living Below Poverty Threshold (% of population)	Population of Racial Minority ¹ (% of population)
State of Alaska	733,391	11	59.4
Anchor Point	2,105	12.7	14.5
Homer	5,522	12.7	16.9
Iliamna	108	28.6	75.9
Kenai	7,424	15.7	28.7
Lime Village	13	0	100
Newhalen	92	7.78	88
Ninilchik	845	17.1	22.1
Nondalton	133	2.5	84
Pedro Bay	43	0	53.4
Port Alsworth	186	0.6	35.5
Seldovia	199	12	34.2
Tyonek	152	16.3	98.6

¹Minority populations were calculated by subtracting the White population from the total population.

Sources: DataUSA 2022; U.S. Census Bureau 2020a, 2020b, 2020c, 2020d, 2020e, 2020f, 2020g, 2020h, 2020I, 2020J, 2020K

Iliamna has 28.6 percent of the population living below the poverty threshold. Therefore, Iliamna meets the criteria for a poverty area. Five of the resident zone communities have a minority population above 50 percent. Tyonek, a non-resident zone community, also has a minority population above 50 percent. Therefore, Iliamna, Lime Village, Newhalen, Nondalton, Pedro Bay, and Tyonek represent environmental justice communities of concern.

Additional Trends and Planned Actions

There are no additional trends or planned actions that would impact environmental justice in the Project area. There are no plans for other management changes in the proximity of the Project that would impact environmental justice. The Park and the surrounding areas would continue to be managed in ways similar to current conditions.

3.15.2 Environmental Consequences

3.15.2.1 Option 1 – No Action

Impacts of Option 1

Under Option 1, the easements would not be conveyed for either a port or a transportation route and the conditions of ANCSA and the 1976 Act would not be fulfilled. As a result, impacts to environmental justice would be the same as described above, in the “Current and Expected Future Conditions of the Environment.”

Additional Impacts from Planned Actions

Under Option 1, an easement would not be conveyed and there would be no impacts to environmental justice; therefore, the environment would remain the same as or similar to the “Current and Expected Future Conditions of the Environment” section. Past, present, and reasonably foreseeable actions and their impacts would be the same as those described in the “Current and Expected Future Conditions of the Environment” section.

3.15.2.2 Option 2 – CIRI’s Initial Proposal

Phase 1 – Planning Phase Activities

The conveyance of easements at the port area and the north and south transportation corridor would have no impacts to all of the environmental justice communities of concern. Given the distance of these communities to the easement areas, it is unlikely that the environmental justice communities of concern would be disproportionately impacted by noise and other disturbances during Planning Phase activities.

Phases 2 and 3 – Construction and O&M

There are no site-specific designs or plans for Construction and O&M of the port or rail/road. Consequently, it is unknown if Phases 2 and 3 would have disproportionate impacts on the environmental justice communities of concern; however, given the distance of these communities to the easement areas, it is unlikely that they would be disproportionately impacted by noise and other disturbances. Once sufficient detail is developed, additional environmental review, along with development of additional Terms and Conditions, would occur.

Additional Impacts from Planned Actions

There are no additional trends or planned actions that would impact environmental justice communities in the Project area. Therefore, we expect no impacts and expect things to remain the same as current conditions during Planning Phase.

Again, it is unknown if Phases 2 and 3 would have disproportionate impacts on the environmental justice communities of concern.

3.15.2.3 Option 3 – Conveyance of North Transportation Corridor and Hungryman Creek Port Area

Phase 1 – Planning Phase Activities

Impacts would be the same as described for Option 2.

Phases 2 and 3 – Construction and O&M

Impacts would be the same as described for Option 2.

Additional Impacts from Planned Actions

Impacts would be the same as described for Option 2.

3.15.2.4 Option 4 – Conveyance of South Transportation Corridor and Deep Water Port Area

Phase 1 – Planning Phase Activities

Impacts would be the same as described for Option 2.

Phase 2 and 3 – Construction and O&M

Impacts would be the same as described for Option 2.

Additional Impacts from Planned Actions

Impacts would be the same as described for Option 2.

3.15.2.5 Comparative Conclusion of Options

Under Options 2, 3, and 4, there would be no impacts to the six environmental justice communities of concern. Every community is located over 50 miles away from the Project site and is therefore unlikely to be disproportionately impacted by noise and other disturbances.

There are no site-specific designs or plans for Construction and O&M of the port or rail/road. Consequently, it is unknown if Phases 2 and 3 would have disproportionate impacts on the environmental justice communities of concern; however, given the distance of these communities to the easement areas, it is unlikely that they would be disproportionately impacted by noise and other disturbances. Once sufficient detail is developed, additional environmental review, along with development of additional Terms and Conditions, would occur.

3.16 SOCIOECONOMICS

3.16.1 Current and Expected Future Conditions of the Environment

The Park does not have a concessionaire who runs dining and lodging facilities on Park property. All dining and lodging options are located on private property and owned and operated by private sector businesses. The Park's field office and visitor contact station are located in Port Alsworth. Also, in and around Port Alsworth are a number of businesses and non-profits that provide guided and unguided commercial services to visitors along the coast and near the Park's field office. There are no developed Park facilities in the easement areas or Tuxedni Bay, although there are four cabins located in the port area easement (shown on Figure 3-4).

A number of air taxis are permitted to operate within the Park. Commercial operators work out of Anchorage, Chugiak, Homer, Kenai and Soldotna, Kodiak, and Port Alsworth. Businesses on the eastern side of Cook Inlet on the Kenai Peninsula primarily offer guided bear viewing and photography tours via air and boat from May to September. Many businesses utilize wheel planes and boats to access beaches at Chinitna Bay and Silver Salmon Creek.

There are private lodges within the boundaries of the Park and along the western shores of Cook Inlet accessible only by boat or plane (Figure 3-5). Silver Salmon Creek Lodge and Alaska Homestead Lodge are located on the coastline of the Park, at Silver Salmon Creek. These lodges offer guided photography tours, sport fishing, boat tours, bear viewing, and outdoor activities and excursions (Silver Salmon Creek Lodge 2024). Snug Harbor Outpost is a lodge located at a former cannery on Chisik Island across Tuxedni Channel from the Deep Water port area easement. This lodge offers visitors a variety of activities and excursions within the Park (Snug Harbor Outpost 2021). Redoubt Mountain Lodge at Crescent Lake takes visitors to areas in Tuxedni Bay for bear viewing during the summer season as well. Additional information on bear viewing, economic output, and visitor experience can be found in Section 3.12.

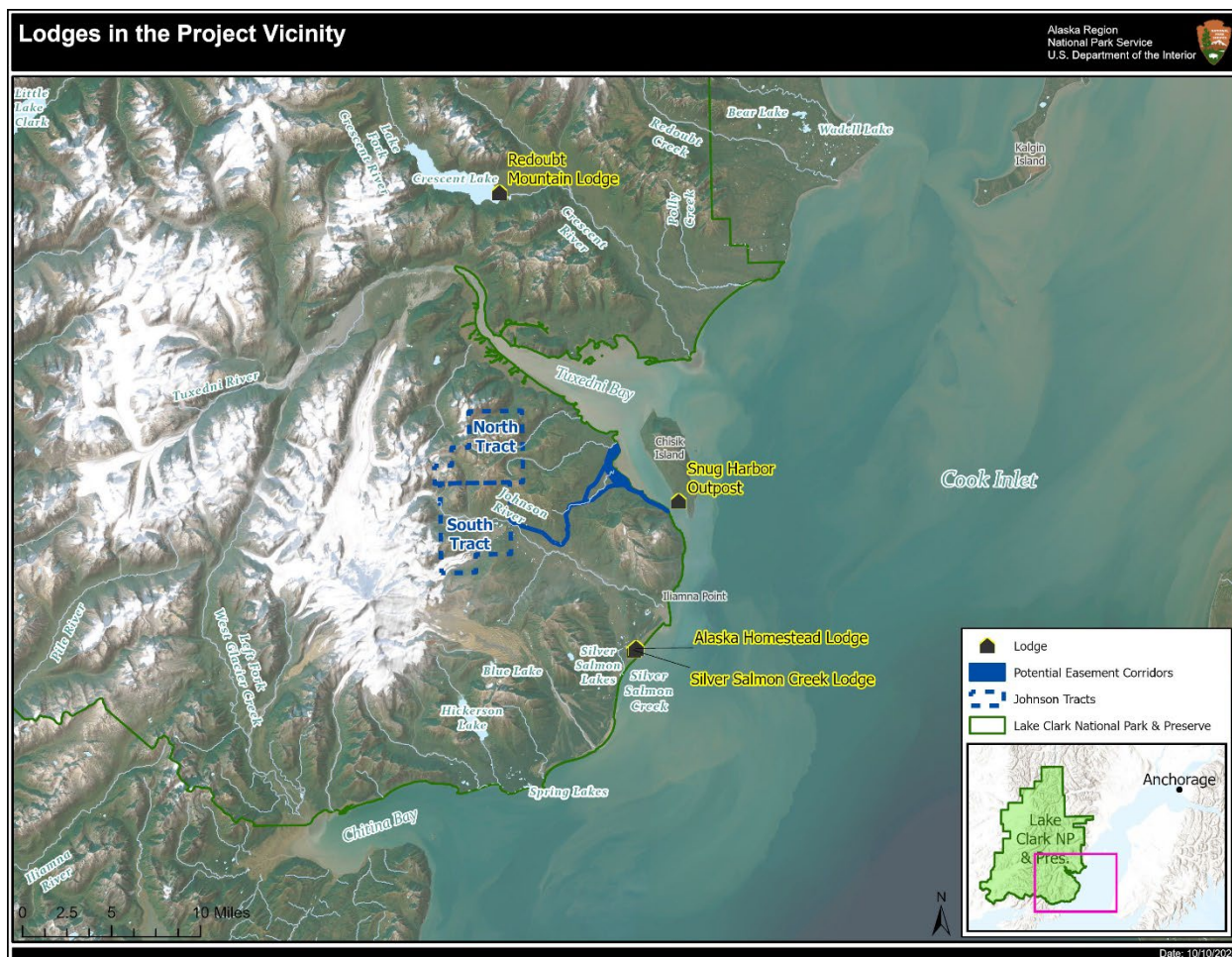


Figure 3-5. Lodges in the Project Vicinity

Additional Trends and Planned Actions

As part of the Cook Inlet Planning Area Oil and Gas Lease Sale 258 (which took place December 30, 2022), there is potential for oil and gas exploration and development in Cook Inlet; however, a July 2024 judicial ruling suspended the lease sale (U.S. District Court of Alaska Case No. 3:22-cv-00279-SLG). It is unclear if the lease sale will be permitted at this time. In the past, lease sale exploration and development in Cook Inlet has been supported by shore-based facilities from Anchorage and facilities and harbors on the Kenai Peninsula and provides a beneficial socioeconomic impact to these areas. Additional activities in the area that are associated with exploration and development of any potentially leased areas could include an increase in aircraft and vessel traffic near the easements. There are no additional trends or planned actions that would impact socioeconomics in the Project area. There are no plans for other management changes in the proximity of the Project that would impact socioeconomics. The Park and the surrounding areas would continue to be managed in ways similar to current conditions.

3.16.2 Environmental Consequences

3.16.2.1 Option 1 – No Action

Impacts of Option 1

Under Option 1, the easements would not be conveyed for either a port or a transportation route and the conditions of ANCSA and the 1976 Act would not be fulfilled. As a result, impacts to socioeconomics would be the same as described above, in the “Current and Expected Future Conditions of the Environment.”

Additional Impacts from Planned Actions

Under Option 1, an easement would not be conveyed and there would be no impacts to socioeconomic; therefore, the environment would remain the same as or similar to the “Current and Expected Future Conditions of the Environment” section. Past, present, and reasonably foreseeable actions and their impacts would be the same as those described in the “Current and Expected Future Conditions of the Environment” section.

3.16.2.2 Option 2 – CIRI’s Initial Proposal

Phase 1 – Planning Phase Activities

Use of helicopters in the area has potential to disturb wildlife in the easement areas and beyond (since noise generated from helicopter use would extend beyond the easement boundaries). Helicopter access during the Planning Phase would be allowed from June 1 through September 30 (120 days) annually. During this time, access to visitor excursions in the Tuxedni Bay area would remain open for wildlife viewing and access to beaches. Visitors may encounter other humans during the pedestrian and geotechnical surveys. Businesses and lodges in the area utilize Tuxedni Bay coastline for bear and fossil viewing, fishing, and other excursions. The presence of additional people, noise, and activity in the area may cause temporary displacement of wildlife that may impact wildlife viewing and fishing during the short operating season for commercial operators. Activity in or around the Deep Water Port area would be especially disruptive to operations at the Snug Harbor Outpost, which is directly across the Tuxedni Channel from the port area.

Businesses, lodges, guides, and visitors may be able to view and hear Planning Phase activities near the proposed port area, but access is not expected to be denied during the Planning Phase.

Option 2 contains less protective Terms and Conditions than Options 3 and 4 regarding wildlife, which could negatively impact businesses that offer services related to wildlife viewing and fishing. Additionally, Option 2 Terms and Conditions do not provide limits to the number of helicopter flight hours in each easement area, which could be especially disruptive to operations at Snug Harbor Outpost when operations were occurring in or near the port easement.

Phases 2 and 3 – Construction and O&M

Construction and O&M of the proposed transportation corridor and port area have the potential to impact socioeconomic resources. Many lodges and operators providing excursions utilize the coastline of the port area easement for wildlife viewing, fishing, and other activities.

The easements will be amended both at the Construction and O&M Phases and access to the public may change when that occurs. Broadly, visitor access within the easement areas is anticipated to be restricted during the Construction and O&M Phases due to health and safety as well as operational concerns. If access to the easements is restricted, it is likely to become a

much less desirable location for visitation. Areas in and around the easements are some of the few places on Park land where bear viewing is accessible to the public. Other bear-viewing locations in the area are located on private land. If public access to the easement areas is denied or if Construction and O&M activities impact wildlife habitat and behavior, the Project would have long-term socioeconomic impacts on those businesses that rely upon these areas. See Section 3.4.2 for more details on wildlife impacts.

Additional Impacts from Planned Actions

Impacts from planned activities such as the potential for future oil and gas development may impact access and increase noise impacts to socioeconomic resources. NPS is currently in the process of updating the Coastal Management Plan, which is intended to improve visitor experience at key coastal sites, which may increase use of the area and businesses that rely on access to the Park and Park resources.

3.16.2.3 Option 3 – Conveyance of North Transportation Corridor and Hungryman Creek Port Area

Phase 1 – Planning Phase Activities

The conveyance of the north transportation corridor and Hungryman Creek port area easements could make visitation and therefore commercial use of the Tuxedni Bay area less desirable because of the increased aviation, helicopter, barge, and drilling activity in the easement area. Impacts to wildlife viewing, fishing, and other activities at the site would be similar to Option 2, though Option 3 has a smaller footprint and the Terms and Conditions are more protective of wildlife and helicopter use and therefore impacts would be less than Option 2. The conveyance of easements is not expected to impact the presence or authorization of commercial use authorization holders or concessioners within the Park.

Phases 2 and 3 – Construction and O&M

Impacts would be the same as described for Option 2.

Additional Impacts from Planned Actions

Impacts would be the same as described for Option 2.

3.16.2.4 Option 4 – Conveyance of South Transportation Corridor and Deep Water Port Area

Phase 1 – Planning Phase Activities

Planning Phase impacts would be the same as the impacts for Option 3. The only difference would be the location of the transportation corridor and port area easement to the south transportation corridor and Deep Water port area easement, which is directly across from the Snug Harbor Outpost.

Phases 2 and 3 – Construction and O&M

Impacts would be the same as described for Option 2.

Additional Impacts from Planned Actions

Impacts would be the same as described for Option 2.

3.16.2.5 Comparative Conclusion of Options

Options 3 and 4 would have similar impact to socioeconomic resources due to the more restrictive Terms and Conditions for flights and wildlife. During the Planning activities, access

to lodges and excursion sites may be limited or impacted by helicopter flights, but is not expected to be denied.

The easements will be amended both at the Construction and O&M Phases and access to the public may change when that occurs. Broadly, visitor access within the easement areas is anticipated to be restricted during the Construction and O&M Phases due to health and safety as well as operational concerns. Access to areas near the port area easements under all options may be revoked once Construction and O&M Phases begin. Options 2 and 4 would include greater impacts to visitors to Snug Harbor Outpost during Construction and O&M Phases.

3.17 WILDERNESS

3.17.1 Current and Expected Future Conditions of the Environment

The Park has approximately 2,473,000 acres of federally designated wilderness (the Jay S. Hammond Wilderness); 24,000 acres of non-NPS designated wilderness; and 1,120,000 acres of eligible wilderness. In the Project area, the port area easements (1,307, 264, and 549 acres for Options 2, 3, and 4, respectively) and most of the north and south transportation corridor (2,453, 924, and 890 acres for Options 2, 3, and 4, respectively) would be in areas classified as eligible wilderness (shown on Figure 3-6). The western end of the north and south transportation corridor (126 acres) would be in areas classified as ineligible wilderness.

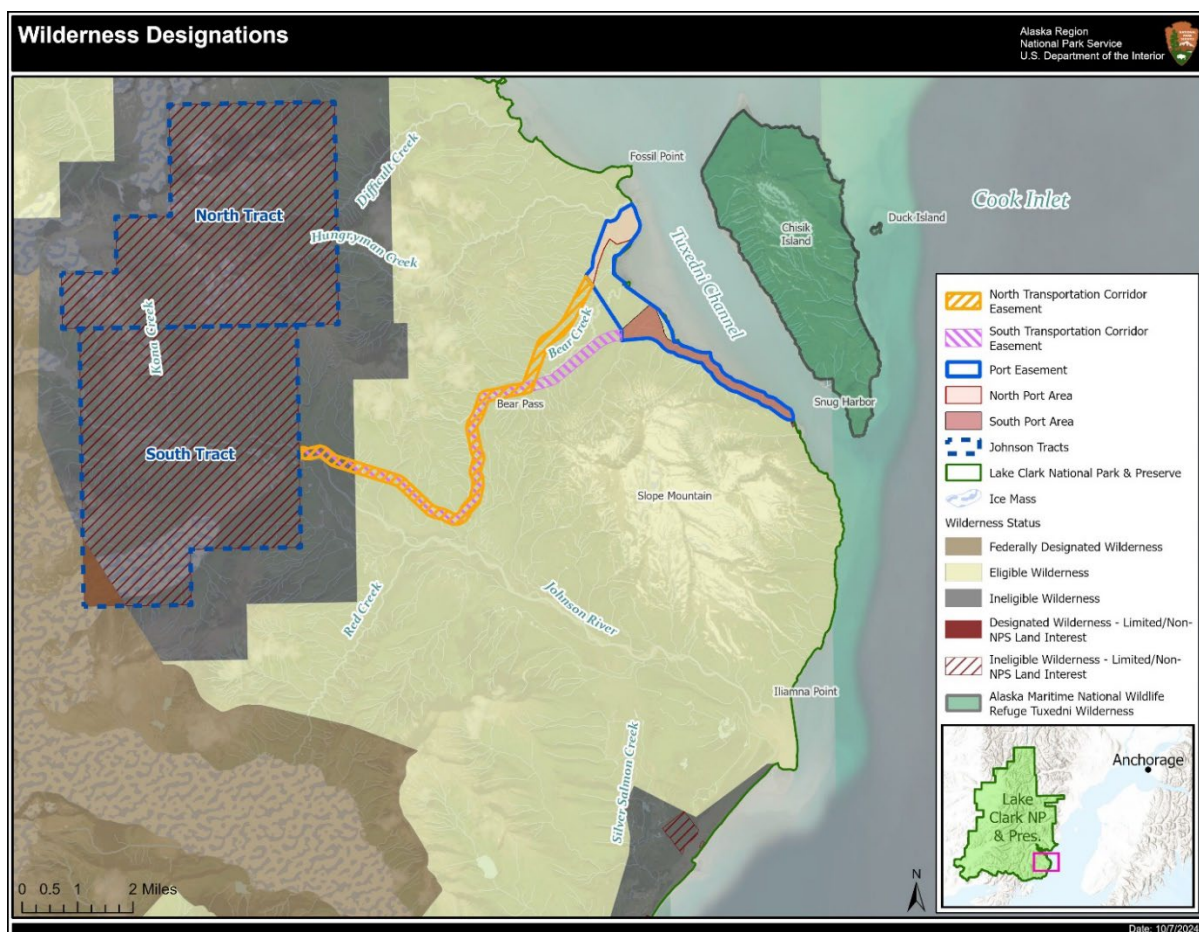


Figure 3-6. Wilderness Designations in the Project Area

Eligible wilderness means that NPS has determined through a Wilderness Eligibility Assessment that the land possesses the qualities and character which would qualify it for possible future designation within the National Wilderness Preservation System. Eligible wilderness is managed to preserve wilderness character, according to NPS policy and Director's Order 41 (NPS 2024h). Eligible wilderness can become designated wilderness through an act of Congress.

A wilderness, in contrast to those areas where humans dominate the landscape, is defined by the qualities composing its wilderness character. Wilderness character encompasses a combination of biophysical, experiential, and symbolic elements as described by four principal qualities: natural, undeveloped, untrammeled, and having outstanding opportunities for solitude or a primitive and unconfined type of recreation. These qualities are summarized below for the Park (NPS 2014b).

- *Natural*: Being remote and relatively difficult to access, little biophysical degradation has occurred in the wilderness area. Ecosystem processes are largely intact throughout the Park. Habitats are seamlessly interconnected, and much of the area has been left to the forces of nature. Uninterrupted ecological processes are prevalent and contribute to pristine conditions (NPS 2014b).
- *Undeveloped*: The Park is one of the least developed in the National Park System. Remoteness, difficulty of access, and the associated high cost of access has helped protect the area's undeveloped quality. In general, installations that occur in the Lake Clark Wilderness are barely noticeable across the landscape and do not include large structures such as prominent buildings or roads (NPS 2014b).
- *Untrammeled*: The isolation, geography, and weather associated with the Lake Clark Wilderness make human influence difficult. There is a legacy of not taking management actions to maintain the untrammeled quality of wilderness character (NPS 2014b).
- *Solitude*: There are a multitude of opportunities for primitive, unconfined recreation in the wilderness area, and except for fishing and sport hunting, recreation in the wilderness area is unconfined. Natural soundscapes and naturally dark night skies contribute to the visitors' sense of remoteness and solitude (NPS 2014b).

Additional nearby wilderness areas include the Tuxedni Wilderness, which Congress designated in 1970. This wilderness area consists of two islands, Chisik Island and Duck Island, both managed by USFWS. Snug Harbor Packing Company historic district is located on the southern end of Chisik Island and occupies a small, non-wilderness area of the island. Chisik Island is across the Tuxedni Channel from the Project area and at its closest point is less than 1 mile from the Deep Water port area easement site.

3.17.1.1 Additional Trends and Planned Actions

As part of the Cook Inlet Planning Area Oil and Gas Lease Sale 258 (which took place December 30, 2022), there is potential for oil and gas exploration and development in Cook Inlet which could impact the natural and solitude wilderness qualities along the shoreline of the Project area from additional noise and visibility of aircraft and vessels; however, a July 2024 judicial ruling suspended the lease sale (U.S. District Court of Alaska Case No. 3.22-cv-00279-SLG). It is unclear if the lease sale will be permitted at this time. There are no additional trends or planned actions that would impact the eligible wilderness in the Project area. NPS would continue to manage the Project area to maintain wilderness character.

3.17.2 Environmental Consequences

3.17.2.1 Option 1 – No Action

Impacts of Option 1

Under Option 1, the easements would not be conveyed for either a port or a transportation route and the conditions of ANCSA and the 1976 Act would not be fulfilled. As a result, impacts to the natural, undeveloped, untrammeled, or solitude qualities of wilderness would be the same as described above, in the “Current and Expected Future Conditions of the Environment.”

Additional Impacts from Planned Actions

Under Option 1, an easement would not be conveyed and there would be no impacts; therefore, the environment would remain the same as or similar to the “Current and Expected Future Conditions of the Environment” section. Past, present, and reasonably foreseeable actions and their impacts would be the same as those described in the “Current and Expected Future Conditions of the Environment” section.

3.17.2.2 Option 2 – CIRI’s Initial Proposal

Phase 1 – Planning Phase Activities

During Planning Phase activities, the proposed easement areas would remain in eligible wilderness. Under this option, this phase would adversely affect wilderness qualities in the following ways:

- *Natural:* This quality is degraded by intended or unintended effects of people on the ecological systems. Clearing for helipads and drill pads would impact vegetation in specific locations temporarily until they are no longer needed and can be reclaimed. This would reduce habitat but would have a small impact to the natural quality of the Project area. The presence of people and equipment may cause wildlife to temporarily change behavior, which would also have a small impact on the natural quality. Boreholes would negatively impact the natural quality, and fuel spills have the potential to impact vegetation and wildlife.
- *Undeveloped:* This quality is degraded by the presence of structures, installations, habitations, and by the use of motor vehicles, motorized equipment, or mechanical transport that increases the ability of people to occupy or modify the environment. During the Planning Phase activities, the presence of helicopters, geotechnical drills, installation of stream gauges, and other equipment would have a temporary impact on the undeveloped characteristic of the Project area. Any vegetation clearing would require non-motorized hand tools to reduce these impacts. After reclamation, the area would return to its current state, installations would be removed, and the undeveloped quality would be restored.
- *Untrammeled:* This quality is degraded by modern human activities or actions that control or manipulate the components or processes of ecological systems inside the wilderness. The Planning Phase activities would have little impact on ecological systems in the Project area. There would be some temporary impacts to vegetation and wildlife behavior that would be returned to current conditions after reclamation.
- *Solitude:* This quality is about the opportunity for people to experience wilderness and is degraded by settings that reduce these opportunities, including visitor encounters, signs of modern civilization, recreation facilities, and management restrictions on visitor behavior. Planning Phase activities would have a temporary impact on the solitude of visitors who expect to see no human activity. Visitors may encounter other humans during the pedestrian

and geotechnical surveys. Visitors to the Tuxedni Wilderness would experience noise from helicopters. The number of people expected for survey activity would not be large, and there would be other places in the vicinity for other visitors to experience solitude.

Option 2 includes 3,760 acres in eligible wilderness and 126 acres in ineligible wilderness. For vegetation impacts and acreages, please see Section 3.10.2.2.

Phases 2 and 3 – Construction and O&M

The Construction and O&M of a port and road/rail would change the qualities of the area such that those lands would no longer meet the requirements of wilderness eligibility. The Park would be required to change the wilderness classification of the easements, along with an associated buffer, from eligible to ineligible wilderness. This would be the same classification as the lands directly adjacent to the Johnson Tract.

The transportation corridor easement would be reduced from 1,000 feet during Planning Phase actions to 250 feet wide and 100 feet wide for Construction and O&M, respectively (Table 1-2). Because there are no site-specific designs or plans for Construction and O&M of the port or rail/road, including the alignment of the road/rail, impacts to wilderness cannot be accurately estimated. Additionally, the port area easement may be reduced in size after Planning activities. Using the existing Planning Phase easement and assuming a 1-mile buffer from the 1,000-foot transportation corridors (which is larger than the Construction and O&M Phases at 250 feet and 100 feet, respectively), and a 1-mile buffer from the port area easement, the total eligible wilderness removed from the Park would be no more than 22,632 acres of the full port area and both transportation corridors. This is a conservative estimate and would be much less once the port easement is reduced, either a north or south transportation corridor is selected, and once alignment of the road/rail is known.

The Construction and O&M of a port and road/rail would continue to have impacts on nearby wilderness qualities as described below:

- *Natural:* The construction of a road/rail and facilities could adversely affect the habitat, movement, feeding, nesting, and reproduction of wildlife in and across the transportation corridor and port area by causing permanent wildlife habitat loss and removing or limiting access to wetland/water and upland habitat types, depending on road/rail siting. This habitat loss and access limitations may result in wildlife avoiding the port and transportation corridor areas. In the transportation corridor and the port area easement, removal of vegetation would adversely impact vegetated lands. The vegetation types that are most common in the transportation and port area easement and that would likely experience the greatest area of impacts from Construction and O&M are upland shrublands and meadows as well as upland forests and woodlands (see Section 3.10, Vegetation). Additional impacts would occur to water quality, soundscapes, and night skies, as discussed in Sections 3.7, Water Quality and Surface Water Hydrology, 3.8, Soundscapes, and 3.12, Visitor Use and Experience.
- *Undeveloped:* The presence of structures and habitations at the port area, combined with the use of motor vehicles, vessels, and other equipment at the port area and along the transportation corridor, would have substantial impact on the undeveloped quality in the Project area and the Tuxedni Wilderness.
- *Untrammeled:* Activities that impact untrammeled wilderness qualities are those that intentionally manipulate the earth and its community of life, such as environmental restoration, fire management, and exotic species control. Prior to Construction and O&M,

the acreages for the transportation and port area easements and an appropriate buffer would be removed from eligible wilderness. Thus, it is likely that trammeling activities would remain within the easements and the associated boundary. Therefore, there would be no anticipated impacts from Construction and O&M to the untrammelled wilderness qualities as the area would be classified as ineligible.

- *Solitude:* The permanent placement of a port and a road/rail would impact the solitude of visitors in the Park and the Tuxedni Wilderness from the people, vessels, and vehicles using the site. Viewing the night sky may be impacted by lighting at the port area and along the transportation corridor. The road/rail would impact overland visitors to the area from the noise and presence of vehicles and people in the corridor.

Additional Impacts from Planned Actions

The land composing the Johnson Tract was part of an exchange between CIRI and the U.S. government to fulfill their land selections under ANCSA. When the lands became private inholdings, they were no longer eligible to be classified as wilderness or eligible wilderness. The area surrounding the tract (one section along all boundaries—a 1-mile buffer) also became ineligible to be classified as wilderness.

Overall, the impacts of other trends and planned actions that may affect wilderness are described above in “Current and Expected Future Conditions of the Environment.” As discussed, oil and gas development in Cook Inlet could impact wilderness qualities from the shore of the Project area.

3.17.2.3 Option 3 – Conveyance of North Transportation Corridor and Hungryman Creek Port Area

Phase 1 – Planning Phase Activities

The impacts of Option 3 would be similar to the impacts for Option 2. Option 3 has a smaller area for the transportation corridor and port easement area that would require a change in classification from eligible wilderness to ineligible wilderness. Impacts would be less under Option 3 than Option 2 because there would be more restrictive Terms and Conditions to wildlife, water quality, soundscapes, wetlands, and vegetation. Option 3 has 1,188 acres of eligible wilderness and 126 acres of ineligible wilderness.

Phases 2 and 3 – Construction and O&M

Impacts would be the same as described for Option 2. The only difference would be the location of the transportation corridor and port area easement that would require a change in classification from eligible wilderness to ineligible wilderness. Using the existing Planning Phase easement and assuming a 1-mile buffer from the 1,000-foot transportation corridor (which is larger than the Construction and O&M Phases at 250 feet and 100 feet, respectively), and a 1-mile buffer from the Hungryman Creek port area easement, the total eligible wilderness removed from the Park would be no more than 16,372 acres. This is a conservative estimate and would be much less once the port easement is reduced and once alignment of the road/rail is known.

Additional Impacts from Planned Actions

Impacts would be the same as described for Option 2.

3.17.2.4 Option 4 – Conveyance of South Transportation Corridor and Deep Water Port Area

Phase 1 – Planning Phase Activities

The impacts of Option 4 would be similar to the impacts for Option 2. Option 4 has a smaller area for the transportation corridor and port area easement that would require a change in classification from eligible wilderness to ineligible wilderness. Impacts would be less under Option 4 than Option 2 because there would be more restrictive Terms and Conditions to wildlife, water quality, soundscapes, wetlands, and vegetation. Option 4 has 1,439 acres of eligible wilderness and 126 acres of ineligible wilderness.

Phases 2 and 3 – Construction and O&M

Impacts would be the same as described for Option 2. The only difference would be the location of the smaller area transportation corridor and port area easement that would require a change in classification from eligible wilderness to ineligible wilderness. Using the existing Planning Phase easement and assuming a 1-mile buffer from the 1,000-foot transportation corridor (which is larger than the Construction and O&M Phases at 250 feet and 100 feet, respectively), and a 1-mile buffer from the full Deep Creek port area easement, the total eligible wilderness removed from the Park would be no more than 18,984 acres. This is a conservative estimate and would be much less once the port easement is reduced and once alignment of the road/rail is known.

Additional Impacts from Planned Actions

Impacts would be the same as described for Option 2.

3.17.2.5 Comparative Conclusion of Options

Under Options 2, 3, and 4, there would be a small impact to the natural, undeveloped, untrammeled, and solitude wilderness qualities during Planning Phases. Impacts would be greater during the Construction and O&M of a port and road/rail. Impacts would be less under Options 3 and 4, since there would be more restrictive Terms and Conditions to wildlife, water quality, soundscapes, wetlands, and vegetation. Under Options 2, 3, and 4, additional impacts from planned actions to wilderness is low.

The most substantial impact to wilderness would be the removal of acreage from the wilderness system. The primary difference between options is the number of acres that would likely require the Park to change the wilderness classification from eligible to ineligible wilderness. Option 2 would require up to 22,632 acres, Option 3 would require up to 16,372 acres, and Option 4 would require up to 18,984 acres, inclusive of a 1-mile buffer as discussed above.

4 CONSULTATION AND COORDINATION

The following sections summarize the consultation and coordination that NPS has undertaken for this Project.

4.1 CIVIC ENGAGEMENT

NPS notified the public of its intention to complete an RA for the Project on June 10, 2024. A civic engagement period occurred from June 10 to June 24, 2024, during which NPS collected public comments by mail and online through the Planning, Environment, and Public Comment portal. Overall, NPS collected 3,446 comment submittals, which resulted in 3,798 unique comments. The comments were reviewed and used to inform this RA.

4.2 TRIBAL CONSULTATION

On June 10, 2024, NPS sent letters to the following tribes and Alaska Native Corporations to provide details about the Project and offer government-to-government consultation should they find it necessary:

- Chickaloon Village Traditional Council
- Kenaitze Indian Tribe
- Knik Tribal Council
- Knikatu, Inc.
- Native Village of Tyonek
- Ninilchik Natives Association Inc.
- Ninilchik Traditional Council
- Salamatof Tribal Council
- Seldovia Native Association Inc.
- Seldovia Village Tribe
- Tyonek Native Corporation

NPS met with Tyonek Native Corporation on June 25, 2024, and the Kenaitze Indian Tribe on July 20, 2024. The Kenaitze Indian Tribe also sent a response to NPS's consultation request on July 30, 2024, and offered input into the subsistence uses of the area and expressed interest in reviewing the RA.

4.3 NATIONAL HISTORICAL PRESERVATION ACT

In accordance with Section 106 of the National Historic Preservation Act, NPS anticipates entering into a programmatic agreement (per 36 CFR § 800.14(b)(1)(ii)) with CIRI and the Alaska State Historic Preservation Office. This clause permits the implementation of a programmatic agreement when effects on historic properties cannot be fully determined prior to the approval of an undertaking. Meetings were held with the State Historic Preservation Office, CIRI, and NPS on July 18 and October 8, 2024. On August 20, 2024, NPS invited the Advisory Council on Historic Preservation to be a signatory to the programmatic agreement and

received their reply declining to participate on August 28, 2024. NPS has also invited several tribes to consult on the programmatic agreement and if they choose to participate in consultation, they may become concurring parties to the final programmatic agreement. On September 24, 2024, NPS sent invitations to engage in government-to-government consultation regarding the Section 106 programmatic agreement and preference to be listed as a concurring party to Chickaloon Village Traditional Council, Kenaitze Indian Tribe, Knik Tribal Council, and Tyonek Native Corporation. During meeting October 9, 2024, between NPS, CIRI and SHPO, the SHPO indicated that Kenai Peninsula Borough, Snug Harbor Outpost and Preservation Alaska should be considered as interested parties. Chickaloon Village Traditional Council has indicated that they are interested in becoming a consulting party and Ninilchik has expressed an interest to learn more about the programmatic agreement. When completed, the programmatic agreement will provide a process, including consultation, for avoiding, minimizing, and if necessary, mitigating any adverse effects to historic properties.

4.4 ESA AND MARINE MAMMAL PROTECTION ACT

In accordance with the ESA, NPS has been engaging with USFWS and NMFS to discuss impacts to marine mammals and federally threatened and endangered species and designated critical habitats that may occur in the Project area. NPS and NMFS met on August 2, August 19, and October 25, 2024, to discuss ESA and marine mammals. NPS and USFWS met on June 5, August 20, and November 1, 2024, to discuss ESA marine mammals.

4.5 MAGNUSON–STEVENS FISHERY CONSERVATION

In accordance with the Magnuson-Stevens Fishery Conservation and Management Act of 1976, NPS has been engaging with NMFS. NPS and NMFS held meetings on July 29 and August 19, 2024, to discuss essential fish habitat.

4.6 ANILCA

Public Law 96-487, ANILCA, Title VIII, Section 810, subtitled Subsistence and Land Use Decisions, outlines the requirements for addressing impacts to subsistence uses of resources in the federal land use decision-making process in Alaska. This section states:

"In determining whether to withdraw, reserve, lease, or otherwise permit the use, occupancy, or disposition of public lands ... the head of the federal agency ... over such lands ... shall evaluate the effect of such use, occupancy, or disposition on subsistence uses and needs, the availability of other lands for the purposes sought to be achieved, and other alternatives which would reduce or eliminate the use, occupancy, or disposition of public lands needed for subsistence purposes. No such withdrawal, reservation, lease, permit, or other use, occupancy or disposition of such lands which would significantly restrict subsistence uses shall be effected until the head of such Federal agency -

- (1) gives notice to the appropriate State agency and the appropriate local committees and regional councils established pursuant to section 805;
- (2) gives notice of, and holds, a hearing in the vicinity of the area involved; and

(3) determines that (A) such a significant restriction of subsistence uses is necessary, consistent with sound management principles for the utilization of the public lands, (B) the proposed activity will involve the minimal amount of public lands necessary to accomplish the purposes of such use, occupancy, or other disposition, and (C) reasonable steps will be taken to minimize adverse impacts upon subsistence uses and resources resulting from such actions."

The ANILCA Section 810 analysis (Appendix B) findings are that the Phase 1 Planning proposed activities for Options 2, 3, or 4 will not significantly restrict current subsistence use in the Project area.

4.7 WILDERNESS ACT

A Minimum Requirements Analysis (Appendix C) is required by law when uses prohibited under Section 4(c) of the Wilderness Act are being considered for a project in wilderness. Section 4(c) states:

"Except as specifically provided for in this Act, and subject to existing private rights, there shall be no commercial enterprise and no permanent road within any wilderness area designated by this Act and except as necessary to meet minimum requirements for the administration of the area for the purpose of this Act (including measures required in emergencies involving the health and safety of persons within the area), there shall be no temporary road, no use of motor vehicles, motorized equipment or motorboats, no landing of aircraft, no other form of mechanical transport, and no structure or installation within any such area."

Any proposed administrative activity that has the potential to affect the wilderness or potential wilderness additions will be analyzed through the minimum requirement process. The Minimum Requirements Analysis is designed to examine whether a project truly needs to occur in wilderness and, if so, how to accomplish it with the least impact to the wilderness resource.

The Minimum Requirements Analysis findings are that during the Planning Phase activities, there could be short-term impacts to the undeveloped, natural, and solitude wilderness qualities from the noise and presence of helicopters and motorized equipment. Other activities, such as vegetation clearing, would have a longer duration impact on these qualities.

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APPENDIX A
GENERAL EASEMENT TERMS AND CONDITIONS COMMON
TO ALL ACTION OPTIONS

GENERAL EASEMENT TERMS AND CONDITIONS COMMON TO ALL ACTION OPTIONS AND ALL PHASES

The following Terms and Conditions are applicable to all action options and would apply to all phases of the Project.

GENERAL

- Except as necessary for the reasonable use of the easement areas, CIRC may not remove, damage, or destroy any Park resources within the easement areas or the Park.
- CIRC must take all measures to avoid or minimize damage to Park resources to the extent reasonable.
- Easement areas must be kept reasonably clean and free of litter or other debris at all times.
- CIRC must act reasonably to prevent and suppress fires resulting from CIRC's activities within the easement areas.
- CIRC must stop work on the easement areas promptly after, and notify the NPS of, the discovery of any federally listed threatened or endangered species within the easement areas.

REPORTING

- CIRC will provide to NPS reporting on an annual basis, within the first quarter of each calendar year, that shall describe: (1) activities performed within the easement areas in the preceding year; (2) activities to be performed within the easement areas in the upcoming year, including the type, frequency, and schedule for such activities; (3) the status of efforts to obtain permits and other authorizations necessary for activities in the easement areas; and (4) resource data collected as part of these activities.
- Annual reports will be updated in advance of any substantial changes to planned activities.

CULTURAL RESOURCES

- CIRC must comply with the terms of any programmatic agreement executed by CIRC and related to the discovery of archeological or historical resources within the easement areas. All natural and cultural resources discovered in the easement areas are the property of the United States.

APPENDIX B
ANILCA SECTION 810 ANALYSIS

ANILCA SECTION 810 ANALYSIS – SHORT FORM

National Park Service – Alaska Region

ANILCA mandates the completion of a Section 810 analysis for any decision to withdraw, reserve, lease, or permit the use, occupancy, or disposition of Federal public lands in Alaska (16 U.S.C. §3120).

Project Title: Lake Clark National Park and Preserve, Johnson Tract Transportation and Port Easements

PEPC Number: 119751

Location of Proposed Action: Lake Clark National Park, in the vicinity of Tuxedni Bay

Summary of Proposed Action: The project will convey a transportation easement and a port easement to CIRI per the conditions of the 1976 Cook Inlet Land Exchange Act, Public Law 94-204. The conveyance process includes three phases. These include Planning, Construction, and Operations and Maintenance. The current analysis examines the Planning Phase. The Planning Phase actions could include activities reasonably necessary to design, engineer, and permit a road, or pipeline, and a port. Once conveyed, the easements will remain in place for as long as CIRI sees mineral potential in the South and North Johnson Tracts.

Dates of Review: 8/30-9/27, 2024

Analysis:

1. Evaluation of the effect of the proposed action(s) on subsistence uses and needs.

The lands affected by the proposed project fall within Game Management Unit 9A and are open to federally qualified subsistence users who are residents of one of the park's five resident zone communities (Pedro Bay, Iliamna, Newhalen, Port Alsworth and Lime Village). These communities are all located on the west side of the Chigmit Mountains, a subunit of the Aleutian Mountains. The project area is on the east side of the mountain range. There is no practical non-aviation-based access from the west side to the east side of the mountains. For this reason, there is no known current federal subsistence use of the proposed project area.

On July 30, 2024, the park received a letter from the Kenaitze Indian Tribe expressing concerns about potential impacts from the project on their traditional clamming beds in the tidal zone of Tuxedni Bay. These clam beds are below mean high tide, however, and therefore fall under the jurisdiction of the State of Alaska, not the National Park Service. Clamming in this area is managed under State regulations rather than Federal Subsistence regulations.

2. Evaluation of the availability of other lands for the purpose sought to be achieved.

There are no other lands outside of the Tuxedni Bay area suitable to achieve the purposes of this action which is to convey a transportation easement and a port easement to CIRI per the conditions of the 1976 Cook Inlet Land Exchange Act, Public Law 94-204.

3. Evaluation of other alternatives that would reduce or eliminate the use, occupancy, or disposition of public lands needed for subsistence purposes.

The NPS is examining four options for the conveyance of the easements. The options are as follows:

Option 1 –No Action

Under the No Action option, the easements for the port and transportation corridor would not be conveyed. There would be no geotechnical assessment work, resource surveys or associated disturbance and no port or road/rail line would be built. This option is described as a basis of comparison to provide robust analysis of impacts under the other action options. If the No Action option is selected, the NPS and CIRI may enter into a mutual agreement for the easements at some point in the future, consistent with the intent of ANCSA and the 1976 Act. A new analysis would be completed, as appropriate, in the future based on the proposal at that time.

Option 2 – CIRI's Initial Proposal

Option 2 encompasses approximately 2584 acres

Option 3– North Transportation Corridor and Hungryman Creek (North) Port

Option 3 encompasses approximately 1314 acres

Option 4 - South Transportation Corridor and Deep Water (South) Port

Option 4 encompasses approximately 1565 acres

After the conveyance of the easements and during the Planning Phase, the transportation or port easement areas are available for public use but access could be restricted for periods of time when CIRI is actively doing work in the area where public access would create safety concerns for the public. This right does not permit the NPS, the public, or any other party to interfere with CIRI's reasonable use of the transportation or port easement areas. The easements will be amended both at the

Construction and Operations and Maintenance Phases and access to the public may change when that occurs.

4. Evaluation of whether an option may “significantly restrict” subsistence use.
Consider whether any of the following may occur:
- a) a substantial reduction in subsistence uses due to factors such as direct impacts on the resource or adverse impacts on habitat:
☐ yes X no
 - b) a large reduction in the abundance of subsistence resources;
☐ yes X no
 - c) a large reduction in subsistence uses due to changes in availability of the resources caused by a major redistribution, migration, or relocation:
☐ yes X no
 - d) a reduction in subsistence uses due to major increases in competition for the resource by non-subsistence users:
☐ yes X no
 - e) a reduction in subsistence uses due to substantial interference with access to harvestable resources, such as by physical or legal barriers:
☐ yes X no

Findings:

This ANILCA Section 810 analysis finds that the proposed action will not significantly restrict current subsistence use in the project area.

Elizabeth Rupp

LACL Cultural Resources Team Lead

Date

APPENDIX C
MINIMUM REQUIREMENTS ANALYSIS

MINIMUM REQUIREMENTS ANALYSIS FRAMEWORK WORKBOOK (NPS Alaska Version)

“...except as necessary to meet minimum requirements for the administration of the area for the purpose of this Act...”

— Section 4(c), Wilderness Act of 1964

Introduction

The Minimum Requirements Analysis (MRA) is designed to examine whether a project truly needs to occur in wilderness, and if so, how to accomplish it with the least impact to the wilderness resource. The framework below is intended to help managers: 1) evaluate actions proposed in wilderness that could impact wilderness character and/or that involve a use otherwise prohibited by the Wilderness Act; and 2) consider appropriate choices about administrative actions they might take. The goal of the MRAF is to help provide consistency in the way wilderness-managing agencies consider actions in wilderness, to help wilderness stewards consider tradeoffs between impacts and benefits, and to ensure that agencies strive to preserve wilderness character through their on-the-ground decisions.

As applicable, per agency policies, collaborate and coordinate with associated Tribe(s) with historical, treaty, or related ties to the area.

MINIMUM REQUIREMENTS ANALYSIS FRAMEWORK WORKBOOK COVER PAGE (NPS Alaska Version)

Project Title:

Johnson Tract Easement Conveyance Planning Activities

Approvals:

Prepared by:

Name: Buck Mangipane

Position: Natural Resource Program Manager

Signature:

Reviewed by:

Name: Greg Kouns

Position: Resource Protection Program Lead

Signature:

Reviewed by:

Name: Elizabeth Rupp

Position: Cultural Resource Program Manager

Signature:

Approved by:

Name: Susanne Fleek-Green

Position: Superintendent

Signature:

Project Title:

Johnson Tract Easement Conveyance Planning Activities 2024

Step 1: Determine If Administrative Action May Be Necessary

Issue Statement:

The National Park Service (NPS) is conveying two easements to provide access to the Johnson Tract within Lake Clark National Park (LACL). The conveyance fulfills the transportation and port easements authorized in the 1976 Cook Inlet Land Exchange (1976 Act). The NPS will complete a Resource Analysis to evaluate the proposed easement areas including site-specific environmental consequences of initial planning activities associated with Cook Inlet Regional Incorporated (CIRI) development of the transportation corridor and port. Planning will be limited to activities that are reasonably necessary for CIRI to design, engineer, and permit their project. Those activities may include geotechnical assessment, hydrological assessments, and cultural and environmental resource surveys. The Resource Analysis will help inform any adjustments the NPS requests to the easement locations proposed by CIRI and NPS ensure that appropriate Terms and Conditions are included in the easements.

Explain the issue that requires action. The issue may be a problem, situation, opportunity, or other circumstance that requires consideration. It is not a proposed action, tool, project, or solution.

Options Outside of Wilderness: Can the issue be resolved or addressed outside of wilderness?

☐ YES STOP – EXPLAIN BELOW AND DO NOT TAKE ACTION

☒ NO EXPLAIN BELOW AND PROCEED TO THE NEXT

All proposed easement locations are within eligible wilderness.

Criteria for Determining Necessity: Do any of the criteria below apply?

A. Do Any Valid Existing Rights Apply?

☒ YES ☐ NO

In 1976, the Cook Inlet Land Exchange Act, Public Law 94-204 provided for additional land selections by Cook Inlet Regional Incorporated (CIRI) to fulfill their land allotment under ANCSA. CIRI was conveyed a 20,942 acre tract of land within LACL in exchange, in part, for CIRI's relinquishment of land selections around Lake Clark.

The "Terms and Conditions" of the 1976 Act stated: "The Secretary shall also convey to CIRI an easement for a port which shall reasonably provide for receiving, shipping,

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Step 2: Determination

storage and incidental handling, and incidental facilities thereto, of the minerals extracted from the lands conveyed. The Secretary shall also convey to CIRI a transportation easement to provide for transportation by road, rail, or pipeline, of the minerals from the above-described lands to the port easement. The Secretary and CIRI shall mutually agree upon the location of these two easements.”

LACL was established by the Alaska National Interest Lands Conservation Act in 1980 and the resulting park boundary surrounded the CIRI tracts.

Valid existing rights are created by a legally binding conveyance, lease, deed, contract, or law. Cite the specific right, terms and conditions, and source.

B. Do Special Provisions of Wilderness Legislation Apply?

☐ YES ☒ NO

What is the special provision in wilderness legislation (i.e., Section 4(d) of the Wilderness Act of 1964 or subsequent wilderness-enabling laws) that requires action? Cite law and section. If there is language regarding a special provision, is it stated in terms of "shall" or "must"? If there is special provision language, is it specific about a type of use, tool, location, or time?

C. Do Requirements of Other Federal Laws Apply?

☐ YES ☒ NO

Does another Federal law, by itself or as implemented or interpreted through Executive Order, court order, etc., require action? Cite law and section. If other laws apply, are they specific about type of use, tool, location, or time?

D. Effects to Wilderness Character: Is action necessary to preserve/maintain one or more of the five qualities of wilderness character, or is action necessary to address a degradation, threat, or impairment of wilderness character?

UNTRAMMELED

☐ YES ☒ NO

Is there an action/project/installation that is intentionally controlling or manipulating the components or processes of ecological systems that this project is in response or relation to? An unauthorized water impoundment, for example.

UNDEVELOPED

☐ YES ☒ NO

Would the project maintain or improve the undeveloped quality? The undeveloped quality can be degraded by structures, installations, motorized or mechanized equipment/access methods, etc.

NATURAL

☐ YES ☒ NO

Would the project maintain or improve the natural quality? Either now or in the future, are there, or could there be, threats to ecological systems (or components of them) that the project would address? Examples of threats include non-native species, air or water pollution, diminished integrity of ecological processes, etc.

OUTSTANDING OPPORTUNITIES FOR SOLITUDE or PRIMITIVE and UNCONFINED RECREATION

☐ YES ☒ NO

Are opportunities for solitude or primitive and unconfined recreation unacceptably degraded? Degradations include threats to opportunities for solitude, recreational facilities that decrease self-reliant recreation, management restrictions on visitor behavior, etc. Would the project maintain or improve this quality?

OTHER FEATURES OF VALUE

☐ YES ☒ NO

Is there a tangible feature: 1- identified in legislation? 2 - on a national register? 3 - that is integral to the meaning of this wilderness? 4 - identified in a local management plan or wilderness character narrative? Is the feature degraded or threatened? How would the project maintain or enhance the tangible feature?

Step 1: Determination – Is Administrative Action Necessary in Wilderness?

Based on the responses and detailed explanations in A through D above, if action must occur in wilderness to address the situation and at least one criterion in A through D is met, check the “Yes” box below. Describe how wilderness character as a whole would be preserved (maintained) or improved as a result of the proposed project. If none of the criteria have been met, action is NOT necessary. Check the “No” box, explain why the proposed project does not meet the criteria, and stop your analysis.

☒ YES EXPLAIN BELOW AND COMPLETE STEP 2

☐ NO STOP – EXPLAIN BELOW AND DO NOT TAKE ACTION

The 1976 Act terms and conditions state that the Secretary shall convey to CIRI an easement for a port and an easement for a transportation route. The easements are not discretionary and thus action must occur in the eligible wilderness.

Step 2: Determine the Minimum Activity

Uncontrollable Timing Requirements

What, if any, are the considerations that would dictate timing of the action?

In 2019, CIRI and HighGold mining company (now Contango Ore, Inc.) entered a 10-year lease of the Johnson Tract for mineral exploration. In 2020, HighGold worked with the NPS for authorization to access NPS land around the Johnson Tract for certain activities associated with their mineral exploration. In January of 2023, CIRI began discussions with NPS to advance the conveyance of the easements.

In June 2024, the NPS received a proposal for deeds for the port and transportation easements. The DOI and NPS are currently negotiating with CIRI on the deeds with an intent to convey the easements in early 2025.

For example, to avoid a critical bird nesting season, work can only be accomplished during snow-free months. Do not include availability of workers, available funding, or other administrative considerations.

Feasibility of Alternatives

Only include alternatives that are feasible and can achieve the goals of the project. Some alternatives that are not feasible may warrant documentation in the “Alternatives Considered but Dismissed” section to provide a brief description and explanation of why it was dismissed and not considered in detail.

Possible reasons for dismissal include alternatives that are logistically or physically impossible, have unacceptable impacts, are unsafe, are proven ineffective, or won’t achieve project goals.

No Action Alternative

Including a No Action Alternative is optional. A No Action alternative can:

- Provide a comparison that identifies if an action alternative would cause greater degradation to wilderness character than doing nothing at all.

- Provide short- and long-term comparisons of effects.

In some situations, the No Action alternative might better preserve the qualities of wilderness character than taking action. This is especially true with more complex issues. Generally, simple issues do not warrant a No Action alternative.

Alternatives

Alternative 1:

Convey easements and provide authorization to conduct planning activities that are reasonably necessary for CIRI to design, engineer, and permit their project. Those activities may include geotechnical assessment, hydrological assessments, and cultural and environmental resource surveys. This would include helicopter landings, clearing of landing zones, developing temporary drill pads, geotechnical drilling, digging of test pits, use of soil probes, and temporary installation of monitoring equipment. The total area of disturbance would be less than 1.5 acres and would occur within the 2587-acre port and transportation easement areas. Of the 2587 acres, 2461 are eligible wilderness.

Description of the Alternative:

This alternative involves using a helicopter to access and transport personnel and equipment to conduct planning activities in the port and transportation easements corridors. This work will help refine the location of the transportation and port easements to the area necessary to meet the needs to support mineral development.

Planning Phase Activities

During the Planning Phase, NPS anticipates that CIRI's use of the Easements will include preliminary engineering and geotechnical assessment through the drilling of boreholes, creation of test pits, hydrology and hydraulics analysis, additional environmental and cultural resource surveys, and associated disturbance. CIRI's use of the easement areas will also include reclamation activities.

Planning Phase activities are expected to be mostly seasonal, with activity primarily occurring from June through September. It is expected that the Planning Phase would last 4-5 years, although it may be longer with written approval from NPS. Activity may vary annually. All activities would be confined to the easement area. Features constructed on the ground, such as helipads and drill pads, would not be permanent or long-term. No roads or other permanent infrastructure will be constructed during this phase.

CIRI has not submitted any work plans or other information on what activities it expects to conduct and when it might conduct them during the Planning Phase. The NPS has made reasonable assumptions of activities that can be expected to occur during the Planning Phase. NPS's assumptions regarding Planning Phase activities are based on prior correspondence, permit requests from CIRI and HighGold, and NPS's experience with other similar projects. Access via air will be necessary. It is our understanding that

most flight operations will be based from CIRI's South Tract. However, it is also possible that CIRI may utilize a barge for helicopter flight operations.

NPS assumes the following activities will occur during the Planning Phase:

Pedestrian Engineering Surveys (does not include geotechnical drilling)

- Ground truthing of previous reconnaissance work, including a GPS-based field survey that will serve as a basis for refining the centerline for the potential transportation easement and site conditions at prospective port within the potential port easement. The pedestrian traverse would consist of walking as much of the potential transportation easement centerline as possible. The traverse will also include site-specific assessments of stream crossings, topography, and other considerations relevant to construction.

- A 2–4-person crew would complete the pedestrian traverse/GPS survey. The estimated time to complete this effort is 8 field days with 3-4 hours of flying time via helicopter per day (total of 32 hours/year). The route traverse would occur after the snow is off and before full green-up around mid-July.

- Shallow soil test pits will be periodically hand dug with a shovel or tested with a 1-inch diameter hand probe.

Geotechnical drilling

- Drill pads would be temporary and are necessary to create a stable, level platform to support the drills and their associated supplies. Pads would be constructed of wood timbers and placed on the ground with minimal surface disturbance. The typical footprint is 20x20ft.

- Between 50-150 boreholes are estimated to be needed for the Transportation Easement and 20-100 for the Port Easement. Per the Terms and Conditions, no drilling equipment shall be used that exceeds 120dB.

- Fuel would be required for each drill. Fuel would be transported via helicopter in fly tanks ranging in capacity from 70 to 130 gallons and incorporating secondary containment. Drilling pads would have fuel stored in secondary containment with cumulative storage of up to 260 gallons. Personnel would be trained in spill prevention and spill response procedures, with training occurring at least annually. Spill kits would be located at all drill and pump sites.

- Drill pads would be deconstructed and reused for subsequent drill holes. Drill pad and helipad reclamation would take place concurrently with drilling operations. Drill pad reclamation would occur after a drill is removed from the drill pad. The drill pad would be deconstructed and moved by helicopter to the next site for reuse.

- The estimated time to complete this effort is 120 field days. It is unknown the amount of flight time needed per year as this would be dependent on the intensity of exploratory work; however, per the proposed Terms and Conditions flight time may not exceed 70 hours per year.

Hydrology and hydraulics analysis

- Stream gauges would be installed in waterways within the easement area to gather stream flow data.
- Water quality sampling work to characterize baseline conditions of waterways. Water quality stations would be established and monitoring is completed in three or four short excursions. A team of 2 field technicians would be at each water quality site for approximately one hour to collect a water sample and record field parameters. Access is via helicopter, which would land in an open area as close as safely practical and wait for the sample to be collected and then move to the next site. Total helicopter flying time for this activity would be approximately 10 hours/year.

Environmental and cultural resource surveys

Cultural Surveys

- Continue to advance reconnaissance surveys within the potential transportation and port easement areas. The survey will be minimally invasive and involve archaeology teams completing field traverses that may include digging shallow pits to provide three-dimensional assessment of any cultural sites. Subsurface testing will be restricted to areas identified as having the potential to contain intact subsurface features or artifacts. Shovel tests will be 50 x 50 cm and will be excavated to a depth of 1 m or sterile soils when possible.
- Pedestrian surveys are expected to be completed over an estimated one-week (cumulative) period in July through September, depending on the availability of archeologists. The team that will perform the work is composed of a maximum of 4-5 people and will access sites via helicopter. Total flying time would be two hours per day for a total of approximately 20 hours flying time/year.
- The cultural resources work plan will be further detailed in the application for an Archaeological Resources Protection Act (ARPA) permit, which will be procured from NPS prior to the field work.

List of potential mechanized equipment

- Helicopters
- Small power tools for cutting, drilling, and fastening used in construction of drill rig platforms.

- Drill rig for bore holes Chain saws and other power tools for removal of vegetation.

What are the details of this alternative? When, where, and how will the action occur? Provide a comprehensive narrative description of the alternative.

Component Methods

How will each of the components of the action be performed under this alternative?

Component	Components	Component Methods for this Alternative
	<i>Example: Transportation of personnel to the project site.</i>	<i>Example: Workers walk to work site.</i>
1	Helicopter flight to support field activities and movement of equipment for project activities.	Use Type 2 helicopter to access and transport equipment. Total flight time will be 70 hours annually, with work taking place between June 1 and September 30.
2	Landings of helicopters for deployment of field crews and for equipment deployment.	Land helicopters at approximately 100 sites annually.
3	Create landing zones for helicopter access.	Clear vegetation from a 14x14 area with some minor brushing on the edges of the area at 20 locations to allow for safe helicopter access (0.09 acres).
4	Create drill pads for geotechnical drilling.	Clear vegetation from a 20x20 area. Use mechanized tools to construct up to 150 pads on site (1.4 acres).
5	Conduct geotechnical drilling.	Operate geotechnical drill rigs to drill up to 250 bore holes.
6	Assess and monitor water quality.	Install water quality monitoring instruments in waters withing easement areas.
7	Assess area for archeological resources.	Pedestrian surveys with test pits dug when needed.

Effects to Wilderness Character

What is the effect of each Component Method on the qualities of wilderness character? Include both positive and negative effects, and cumulative impacts.

UNTRAMMELED: Describe the manipulation of the biophysical environment and its effects. Examples include suppression of natural fire or managing vegetation or wildlife, even if it improves the Natural Quality (e.g., eliminating a non-native species).

No effect from the activities on this component of wilderness character.

UNDEVELOPED: Describe 1. Type and degree of structures and installations: number, duration, and how advanced are materials and technology. 2. Motorized tools or mechanical transport: number, duration, and intensity of use.

Use of helicopter, cutting of landing zones, developing drill pads, using motorized equipment for construction and drilling will negatively impact this quality of wilderness. A maximum of 70 hours of flight annually between June 1 and September 30 (for 4-5 years). Clearing vegetation from up to 150 drill pads and up to 20 helicopter landing zones in the project area. Sounds from motorized equipment to construct/deconstruct pads and sounds of drill rig operations. Some work would be of short duration and low intensity, limiting the impact in time and space. Other activities, such as vegetation clearing, would have a longer duration impact.

NATURAL: Describe the effects to this quality, including any protection, degradation, or restoration of natural conditions.

Use of helicopter, cutting of landing zones, developing drill pads, using motorized equipment for construction and drilling would cause temporary negative impacts to the natural quality. Both in changing the natural vegetation of the area, as well as the potential to disturb wildlife. Helicopter impacts would be for up to 70 hours annually but would be temporary in space and time. Similarly, the use of motorized/mechanical equipment for construction and drilling would also have impacts that would be constrained spatially and temporally. The Impacts to the natural quality from vegetation clearing for landing and drilling pads, would be longer lasting and dependent on the type of vegetation removed, extend of vegetation removed, and ability for reclamation. Overall, vegetation clearing would amount to less than 1.5 acres cumulatively based on the terms and conditions of the easement conveyance.

OUTSTANDING OPPORTUNITIES FOR SOLITUDE or PRIMITIVE and UNCONFINED RECREATION: Explain how opportunities for visitors to experience solitude or a primitive and unconfined type of recreation will be protected or degraded.

Use of helicopter, cutting of landing zones, developing drill pads, using motorized equipment for construction and drilling would cause temporary negative impacts to the opportunities for solitude or primitive and unconfined recreation. Use of helicopter would negatively impact soundscape and solitude. These impacts are temporary in nature. Additionally, the use of motorized/mechanical equipment for construction and drilling would also have impacts on the primitive nature of the area through their presence and noise they generate. These will not be bounded in space to the easement areas but will extend beyond these areas. The presence of equipment and personnel conducting the work will lessen the opportunity for solitude and primitive recreation in the area.

OTHER FEATURES OF VALUE: Describe any effects to tangible features of scientific, educational, scenic, or historical value that are not accounted for in the above qualities, including cultural and paleontological resources that are integral to wilderness character.

No effect from the activities on this component of wilderness character.

Alternative 2:

None

Description of the Alternative:

What are the details of this alternative? When, where, and how will the action occur? Provide a comprehensive narrative description of the alternative.

Component Methods

How will each of the components of the action be performed under this alternative?

Component	Components	Component Methods for this Alternative
	<i>Example: Transportation of personnel to the project site.</i>	<i>Example: Workers walk to work site.</i>
1		
2		Click or tap here to enter text.
3		
4		
5		

Effects to Wilderness Character

What is the effect of each Component Method on the qualities of wilderness character? Include both positive and negative effects, and cumulative impacts.

UNTRAMMELED: Describe the manipulation of the biophysical environment and its effects. Examples include suppression of natural fire or managing vegetation or wildlife, even if it improves the Natural Quality (e.g., eliminating a non-native species).

UNDEVELOPED: Describe 1. Type and degree of structures and installations: number, duration, and how advanced are materials and technology. 2. Motorized tools or mechanical transport: number, duration, and intensity of use.

NATURAL: Describe the effects to this quality, including any protection, degradation, or restoration of natural conditions.

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OUTSTANDING OPPORTUNITIES FOR SOLITUDE or PRIMITIVE and UNCONFINED RECREATION: Explain how opportunities for visitors to experience solitude or a primitive and unconfined type of recreation will be protected or degraded.

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OTHER FEATURES OF VALUE: Describe any effects to tangible features of scientific, educational, scenic, or historical value that are not accounted for in the above qualities, including cultural and paleontological resources that are integral to wilderness character.

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Alternative 3:

Description of the Alternative:

What are the details of this alternative? When, where, and how will the action occur? Provide a comprehensive narrative description of the alternative.

Component Methods

How will each of the components of the action be performed under this alternative?

Component	Components	Component Methods for this Alternative
	<i>Example: Transportation of personnel to the project site.</i>	<i>Example: Workers walk to work site.</i>
1		
2		
3		
4		
5		

Effects to Wilderness Character

What is the effect of each Component Method on the qualities of wilderness character? Include both positive and negative effects, and cumulative impacts.

UNTRAMMELED: Describe the manipulation of the biophysical environment and its effects. Examples include suppression of natural fire or managing vegetation or wildlife, even if it improves the Natural Quality (e.g., eliminating a non-native species).

UNDEVELOPED: Describe 1. Type and degree of structures and installations: number, duration, and how advanced are materials and technology. 2. Motorized tools or mechanical transport: number, duration, and intensity of use.

NATURAL: Describe the effects to this quality, including any protection, degradation, or restoration of natural conditions.

OUTSTANDING OPPORTUNITIES FOR SOLITUDE or PRIMITIVE and UNCONFINED RECREATION: Explain how opportunities for visitors to experience solitude or a primitive and unconfined type of recreation will be protected or degraded.

OTHER FEATURES OF VALUE: Describe any effects to tangible features of scientific, educational, scenic, or historical value that are not accounted for in the above qualities, including cultural and paleontological resources that are integral to wilderness character.

Alternatives Considered but Dismissed

What alternatives were considered but dismissed and why?

A no action alternative was not considered as it would violate the 1976 Cook Inlet Land Exchange Act.

Reasons for dismissing an alternative include: not responsive to the issue; does not meet project objectives; causes greater harm to wilderness character; so costly that it could not be implemented; safety issues/risk cannot be mitigated. Do not eliminate alternatives from full consideration simply because implementation would take more time, money, or personnel, or because the skills or equipment needed are not readily available on the local unit.

Determination – What is the Minimum Activity?

Selected Alternative:

Convey easements and provide authorization to conduct planning activities that are reasonably necessary for CIRI to design, engineer, and permit their project. Those activities may include geotechnical assessment, hydrological assessments, and cultural and environmental resource surveys. This would include helicopter landings, clearing of landing zones, developing temporary drill pads, geotechnical drilling, digging of test pits, use of soil probes, and temporary installation of monitoring equipment.

Explain rationale for selection. How will the project preserve/maintain or improve wilderness character? Include a comparison of the selected alternative with other alternatives. Explain how the benefits of the project to wilderness character as a whole outweigh the impacts.

The required Planning Phase work to make a determination on the transportation and port easement will impact the undeveloped, natural, solitude, and primitive qualities of wilderness. In the case of this project, these impacts will occur over a 4–5-year period between June 1 and September 30. The remote nature of the area and the activities required for evaluating and determining a transportation route and port area will require helicopter use, cutting of landing zones, construction of drilling platforms, geotechnical drilling, installation of water quality monitoring devices, and personnel conducting pedestrian surveys of geologic, cultural, and natural resources. There are no alternatives to these activities that provide the necessary information to fulfill the mandate of the 1976 Act to convey transportation and port easements to CIRI.

CIRI has not submitted any work plans or other information on what activities it expects to conduct and when it might conduct them during the Planning Phase. In order to perform a robust Resource Analysis and inform appropriate terms and conditions for

use of the easements, NPS made reasonable assumptions of activities that can be expected to occur during the Planning Phase. NPS's assumptions regarding Planning Phase activities are based on prior correspondence, permit requests from CIRI and HighGold, and NPS's experience with other similar projects. The amount of activity may vary annually but will be confined to the easement area. Any features constructed on the ground, such as helipads and drill pads, will not be permanent or long-term. No roads or other permanent infrastructure will be constructed during this phase.

The NPS's assumptions regarding Planning Phase activities also informed the extent and duration of work needed. These considerations led to the proposed limits and mitigations that are described below in the mitigation measures section.

Once the planning and feasibility work is completed, the transportation corridor and port easements will be reduced to the minimum size needed to transport minerals and other necessary materials for supporting the operations on the Johnson Tract. At that point, the process to remove these areas from eligible wilderness with a corresponding 1-mile buffer, as currently is applied to the boundary of the North and South Tracts, will be considered.

Approved?	Prohibited Use	Quantity, Timing, Frequency, or Duration
X	Mechanical Transport:	Helicopter flight may occur between June 1 and September 30, with a total of 70 flight hours per year. Planning activities are expected to require up to 5 years to complete, for a maximum of 350 flight hours.
X	Motorized Equipment:	Helicopters, small power tools, and drill rigs will be used between June 1 and September 30. Flight hours are limited to 70 annually.
<input type="checkbox"/>	Motor Vehicles:	
<input type="checkbox"/>	Motorboats:	
X	Landing of Aircraft:	Helicopter landings at approximately 100 locations. Flight will occur between June 1 and September 30.
<input type="checkbox"/>	Temporary Roads:	
X	Structures:	Drill pads will be temporarily constructed to support the drilling of up to 250 geotechnical bore holes.

Approved?	Prohibited Use	Quantity, Timing, Frequency, or Duration
X	Installations:	Water quality monitoring equipment will be temporarily installed in waters within the easement corridors.

What mitigation measures, monitoring, and reporting will be required?

Requirements related to wilderness character that are part of project stipulations:

CIRI and JT Mining are required to collect GPS records of the landing zones, drill pad locations, water monitoring installations, and other pedestrian surveys for natural and cultural resource work on parklands and send them to Buck Mangipane, (907) 717-7044 buck_mangipane@nps.gov. Data will be provided at the end of each field season.

Terms and conditions related to minimizing impacts included in the deed are as follows:

General

1. Activities are restricted to only those resulting in limited or short-term ground disturbance. Short-term means lasting five years or less and ground disturbance means any activity that compacts or disturbs the ground such as the installation of helipads or drill pads.
2. Ground disturbance during the Planning Phase must not exceed 1.5 acres.
3. Planning Phase activities may only occur between June 1 and September 30.
4. No more than 150 exploratory geotechnical boreholes/test pits during the Planning Phase.
5. Drill pads may be no more than 20X20 feet.
6. No more than 70 hours of flight time per operating season is allowed for work within the easement area.
7. The above Terms and Conditions numbered 1-6 are as stated unless prior written approval is provided by the NPS.

Paleontological Resources

1. If paleontological resources are found, CIRI must stop work promptly and report to the National Park Service.

Aircraft/Helicopter Use

1. Helicopter landings on Park lands will be restricted to the easement areas.
2. Wherever possible, helicopter landing sites will be selected in open areas where brushing is either not required and/or where brushing is minimized.
3. No trees will be cut during brushing. For this purpose, a “tree” is defined as anything with a diameter larger than 6 inches and height larger than 15 feet. To further prevent young trees from being cut down, brushing activities will be restricted to shrub or open ecotypes as defined by Wells et. al., 2014.
4. No more than 20 landing sites may be created. Each landing zone must be no greater than 14X14 feet (196 sq ft) unless prior written approval is provided by the NPS.
5. No landing sites may be created within wetlands or standing water.
6. At the end of each field season, a report of landing sites will be provided to the NPS documenting the number of landing sites created, maintained, or reclaimed with a map of all landing sites within the easement area.
7. No more than 70 hours of helicopter flight time per operating season is allowed for work within the easement area unless prior approval is provided by the NPS.

Wildlife

Bears

1. If a field crew encounters a freshly excavated bear den or a bear denning, work in the area may only continue if a minimum separation distance of one kilometer can be maintained. This distance will limit bear disturbance and minimize the chance for a negative human-bear encounter. All encounters will be reported to the NPS.
2. If a bear is observed from a flight, at least one kilometer of distance will be maintained to minimize disturbance. When this distance cannot be maintained, an alternative flight path will be adopted.
3. Food and beverages, food and beverage containers, garbage, harvested fish, and all other scented items must be stored in a bear resistant container (BRC) approved by the NPS, secured within a hard sided building, or within a lockable and hard sided aircraft with the doors closed and secured when left unattended. BRCs include: items approved by the Department of Interagency Grizzly Bear Committee (IGBC) as well as additional items listed by the State of Alaska, Department of Fish and Game, Division of Wildlife Conservation. Lists of these options may be found at:

<http://igbconline.org/certified-products-list/>

<http://www.adfg.alaska.gov/index.cfm?adfg=livingwithbears.bearcontainers>

4. If camping within ½ mile of the coastline of Cook Inlet, CIRI shall adhere to food storage methods found in the Superintendent's Compendium.

Bald Eagles/Migratory Birds

1. Planning Phase activities may not occur within a 660-foot buffer around known bald eagle nests. At the beginning of each season, NPS will provide a map of known nest sites to CIRI for review.
2. Helicopters and fixed-wing aircraft should avoid operating aircraft within 1,000 feet of any eagle nest during the breeding season.
3. Aircraft shall avoid approaching within 1 km of any seabird colony April 15 through August 31 where safety allows. To minimize disturbance to birds, aircraft shall avoid approaching within 1.8 kilometers of all seabird colonies and aircrafts will maintain an altitude of at least 610 meters when flying over seabird colonies.
4. To minimize impacts to nesting seabirds, vessels travelling greater than 5 knots shall not approach within 1.8 km of all seabird colonies.
5. Vegetation removal, including brushing, will only occur outside of the designated migratory bird nesting season, April 15th to July 15th. A biologist with knowledge and practical experience in identifying birds found in this region of Alaska by sight and sound, and bird behaviors indicative of nesting and brood rearing to determine if any nesting birds occur in or near the project area prior to vegetation removal. If it is determined that no nesting birds occur in or near the project area, work may commence during the designated nesting season.

Endangered Species Act/Marine Mammal Protection Act

1. CIRI shall obtain any necessary permits under the Marine Mammal Protection Act.
2. If activities produce underwater pressure levels exceeding 120dB, a Protected Species Observer (PSO) will be required in accordance with NMFS recommendations.
3. Vessels may not be operated in such a way as to separate members of a group of marine mammals.
4. Helicopters may not hover or circle above marine mammals.

6. Aircraft are required to operate at least 1,500 ft (457 m) above sea level when within 500 lateral yards (457 m) of marine mammals, except for an emergency or navigational safety (MMPA/ESA).

7. Drilling activities will not be permitted from September 1 to May 15 when Cook Inlet beluga are present in this habitat (ESA; Castellote et al 2024).

8. **Sea Otters**

a. Vessels operators should conduct activities at the maximum distance possible from groups of sea otters at all times. At a minimum, vessels would avoid approaching within 91 m of sea otters.

b. Vessel operators should avoid multiple changes in direction when within 274 m of groups of sea otters; however, those vessels capable of steering around such groups should do so.

c. Vessels in transit shall be operated at speeds necessary to ensure no physical contact with sea otters occurs. Vessels should avoid multiple speed changes; however, vessels should reduce speed to 10 knots or less when within 274 m of groups of sea otters, especially during poor visibility, to reduce the potential for collisions.

Vegetation & Nonnative Invasive Species

1. To prevent the spread of invasive species into the park, clothing, gear, building materials, and all equipment will be cleaned and be free of soil or plant material before entering the Park.

2. Site visits will be required to geotechnical assessment (i.e., borehole) drilling sites two to three years after reclamation to determine if any invasive species have become established.

3. If invasive species are found in the easement area, the NPS will be consulted for appropriate measures to remove them.

4. Invasive species-related issues and mitigations will be presented within the annual report to the NPS.

5. CIRI will avoid any ground or vegetation disturbing activity at or near any special status plant species. These plants are identified by the Alaska Natural Heritage Program.

6. Any ground disturbance resulting in removal of vegetation will have that vegetation restored. If re-vegetation requires sourcing plants or seeds from outside of

the immediate project area, written approval from the NPS is required prior to application.

Water Quality, Fish, Wetlands, Floodplains, and Aquatic Resources

1. Drilling materials will not be discharged directly into any standing or flowing water or vegetated areas.
2. Any gross introduction of sediment/turbidity to a water source will be reported to the NPS and Alaska Department of Environmental Conservation immediately.
3. Every effort will be made to minimize adverse impacts to wetlands and floodplains, including disruption of natural surface and groundwater flow, soil compaction, and the disturbance of plant root systems.
4. A Spill Prevention and Response Plan must be submitted to the NPS no later than June 1st each year.
5. If drilling fluids and other waste materials are generated during technical engineering exploration, waste material is not permitted to be released into the environment. Any material spills, including fuel spills must be immediately reported to the park in addition to any requirements contained in the operator's spill prevention and response plan.
6. No drilling or installation of boreholes and test pits may occur within wetlands, standing water or other areas as shown on Exhibit ____.
7. Fish Habitat Permits will be obtained from the Alaska Department of Fish and Game Habitat Section regarding Title 16 permit requirements for work in fish bearing waters.
8. Drill pads, helipads, and sumps should be kept at least 50 feet from flowing water.

Geotechnical Operations

1. Sumps will be unlined and used to capture drill cuttings and fluids.
2. Sumps will be dug deeply enough to capture all drill fluids and the surface of the residual drill muds and cuttings will be at least 1.5 feet below the surrounding surface. Place a 0.5-foot- thick bentonite clay cap on drill sumps and cover the clay cap with native soil and native vegetation.
3. CIRI will cease exploration activities when the ground is no longer able to

absorb discharge due to being frozen or saturated.

4. Silt fences will be placed downgradient of sumps to prevent accidental overflows from spreading into the environment.
5. Drillholes will be filled and plugged to inhibit flow after drilling is complete.
6. All products associated with drilling and drillhole reclamation (including products used to seal artesian wells) will always be kept in containment to prevent escape to the environment.
7. Drill cuttings and fluids will not be discharged directly into any standing or flowing water or vegetated areas.
8. CIRI will conduct daily inspections of the drill sites, water sources, and sumps to identify potential issues. Issues will be reported to the NPS immediately.
9. Any gross introduction of sediment/turbidity to a water source will be reported to the NPS and Alaska Department of Environmental Conservation immediately.
10. Water pumps and fuel will be stationed within secondary containment to control any fuel spills.
11. Lubricating grease used for drilling will be stored in secondary containment.
12. A 1/8-inch stainless steel screen will cover the intake hose to prevent organisms from being pulled into the pump. The intake will be placed in a 5-gallon bucket to further mitigate this risk.
13. In situations when stream levels are extremely low and field crews have trouble maintaining sufficient intake flows, work will be suspended until flows increase to minimize potential dewatering impacts to fish downstream. Alternatively, another water source could be used if sufficient flows are present.
14. Drilling fluids will consist primarily of water. Use of non-toxic additives appropriate for use in potable water well drilling may be used when necessary.
15. All bypass water will be mitigated by placing the bypass outlet on well-vegetated or hard-to-erode ground of shallow slope, by configuring the outlet to slow flow, and by inspecting the site twice daily.
16. Sumps and bare ground will be reclaimed using stockpiled overburden and topsoil.

Reclamation

1. Boreholes and test pits that do not collapse in upon themselves will be backfilled.
2. In reclamation, no excavated ground will be left with a slope >15% greater than the surrounding slopes, and soil will be covered by rocks of the same average size as the surrounding rocks, or if initially vegetated, native vegetation.
3. Drill site and cleared helicopter landing zone location coordinates will be provided to the NPS annually.
4. CIRI will provide reasonable logistical support, including but not limited to helicopter support, for an NPS visit to each drill pad and sump location two years following reclamation.

Common to all Options – from General T&Cs for all phases of the easement

General from the deeds under General T&Cs

1. Except as necessary for the reasonable use of the easement areas, CIRI may not remove, damage, or destroy any Park Resources within the easement areas or the Park.
2. CIRI must take all measures to avoid or minimize damage to Park Resources to the extent commercially reasonable.
3. Easement areas must be kept reasonably clean and free of litter or other debris at all times.
4. CIRI must do everything reasonably within its power to prevent and suppress fires resulting from CIRI's activities within the easement areas.
5. CIRI must stop work on the easement areas promptly after, and notify the NPS of, the discovery of any federally listed threatened or endangered species within the easement areas.

Reporting from the deeds under General T&Cs

1. CIRI will provide to the NPS reporting on an annual basis, within the first quarter of each calendar year, that shall describe: (1) activities performed within the easement areas in the preceding year; (2) activities to be performed within the easement areas in the upcoming year, including the type, frequency, and schedule for such activities; (3)

the status of efforts to obtain permits and other authorizations necessary for activities in the easement areas; and (4) resource data collected as part of these activities.

2. Annual reports will be updated in advance of any substantial changes to planned activities.

Cultural Resources from the deeds under General T&Cs

1. CIRI must comply with the terms of any programmatic agreement executed by CIRI and related to the discovery of archaeological or historical resources within the easement areas. All natural and cultural resources discovered in the easement areas are the property of the United States.

2. Prior to beginning ground disturbing work within the easement area, an Archaeological Resources Protection Act (ARPA) permit must be procured from the NPS.

Mitigation can be used to: avoid impacts by not implementing part of an action; minimize impact by limiting the magnitude of the action; rectify impact by rehabilitating the affected environment.

****approval page with signatures is on page 1****