

# ***Preliminary* Environmental Assessment for Proposed Kodiak Microwave Systems, LLC Telecommunications Project**

**U.S. Fish United States Fish and Wildlife Service  
Kodiak National Wildlife Refuge  
1390 Buskin River Road  
Kodiak, AK 9961**

**May 2016**

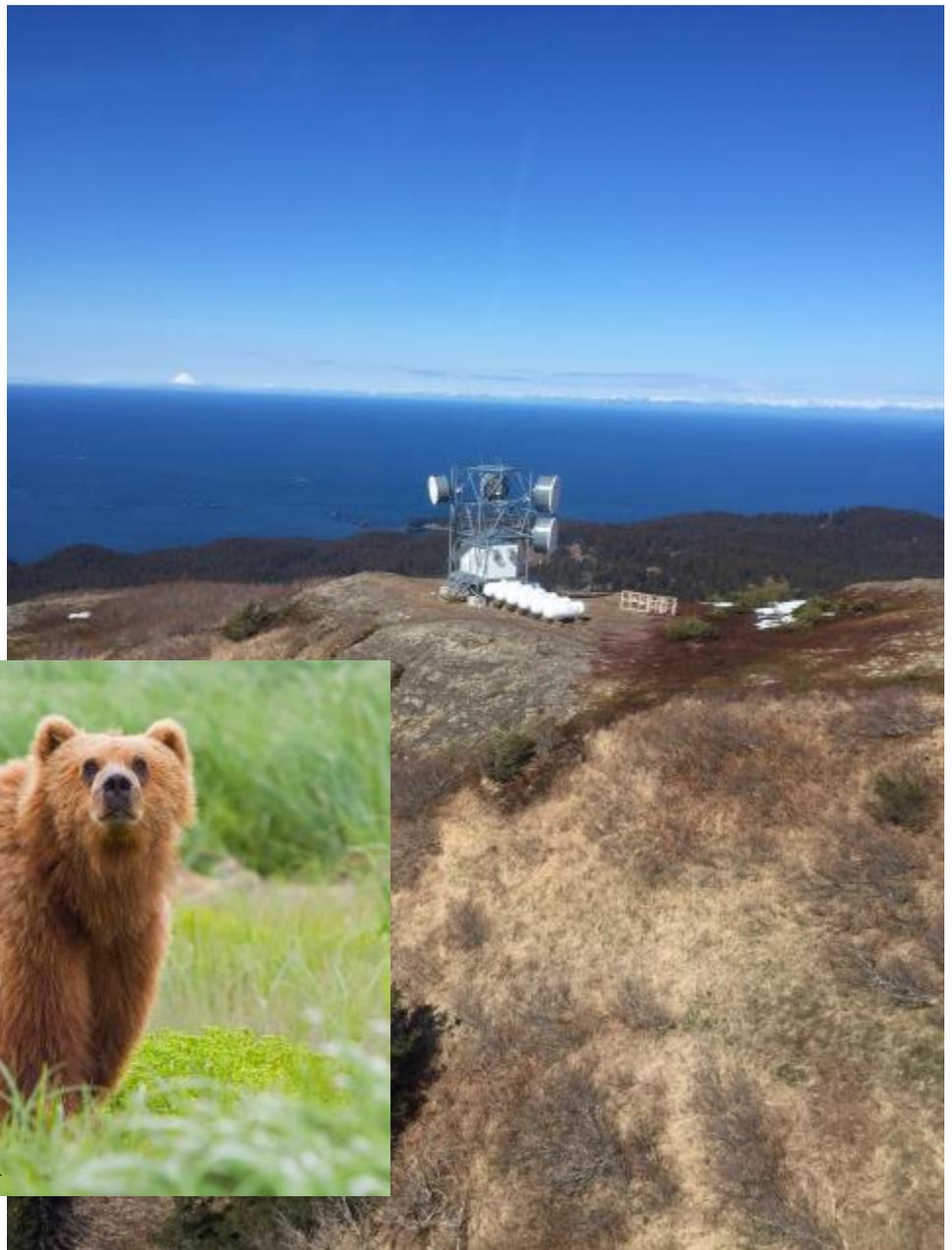


Photo by Yathin Krishnappa

**U.S. Fish & Wildlife Service**  
***Preliminary* Environmental Assessment**  
for

**Proposed Kodiak Microwave Systems, LLC Telecommunications Project,  
Kodiak National Wildlife Refuge, Kodiak Island, Alaska**

This preliminary Environmental Assessment (EA) was prepared in accordance with the US Department of Interior Departmental Manual 516, and is in compliance with the National Environmental Policy Act of 1969 (and subsequent amendments) (P.L. 91-190) and the Council on Environmental Quality Regulations dated November 1978 (40 CFR 1500-1508).

This EA serves as a public document to briefly provide sufficient evidence and analysis for determining the need to prepare an Environmental Impact Statement or a Finding of No Significant Impact.

This EA concisely describes the need for the proposal, a reasonable range of alternatives, and potential environmental impacts of the proposed action and the alternatives. The EA provides a list of the agencies and persons consulted during EA preparation.

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# 1 Introduction & Executive Summary

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The U.S. Fish and Wildlife Service (FWS) is considering an application from Kodiak Microwave System, LLC (KMS) to construct a telecommunication project, (KMS4), on the northwest end of Kodiak Island within the Kodiak National Wildlife Refuge (Kodiak Refuge). The project would provide broadband telecommunication services to the remote communities of Larsen Bay and Karluk, which currently use private satellite networks. Although satellite service currently provides telecommunication services in these rural villages, its often slower speed, frequent delays in connectivity and low reliability limit its usefulness. Without access to broadband internet, Larsen Bay and Karluk lack access to modern education tools, telemedicine, and economic opportunities. This project would address the need for reliable broadband service in Larsen Bay and Karluk by providing high-capacity, high-speed, low delay connectivity. The improved internet connectivity and reliability would provide residents with opportunities to facilitate economic development, and would improve services for health care providers, schools, government, tribal and non-profit entities and residential users.

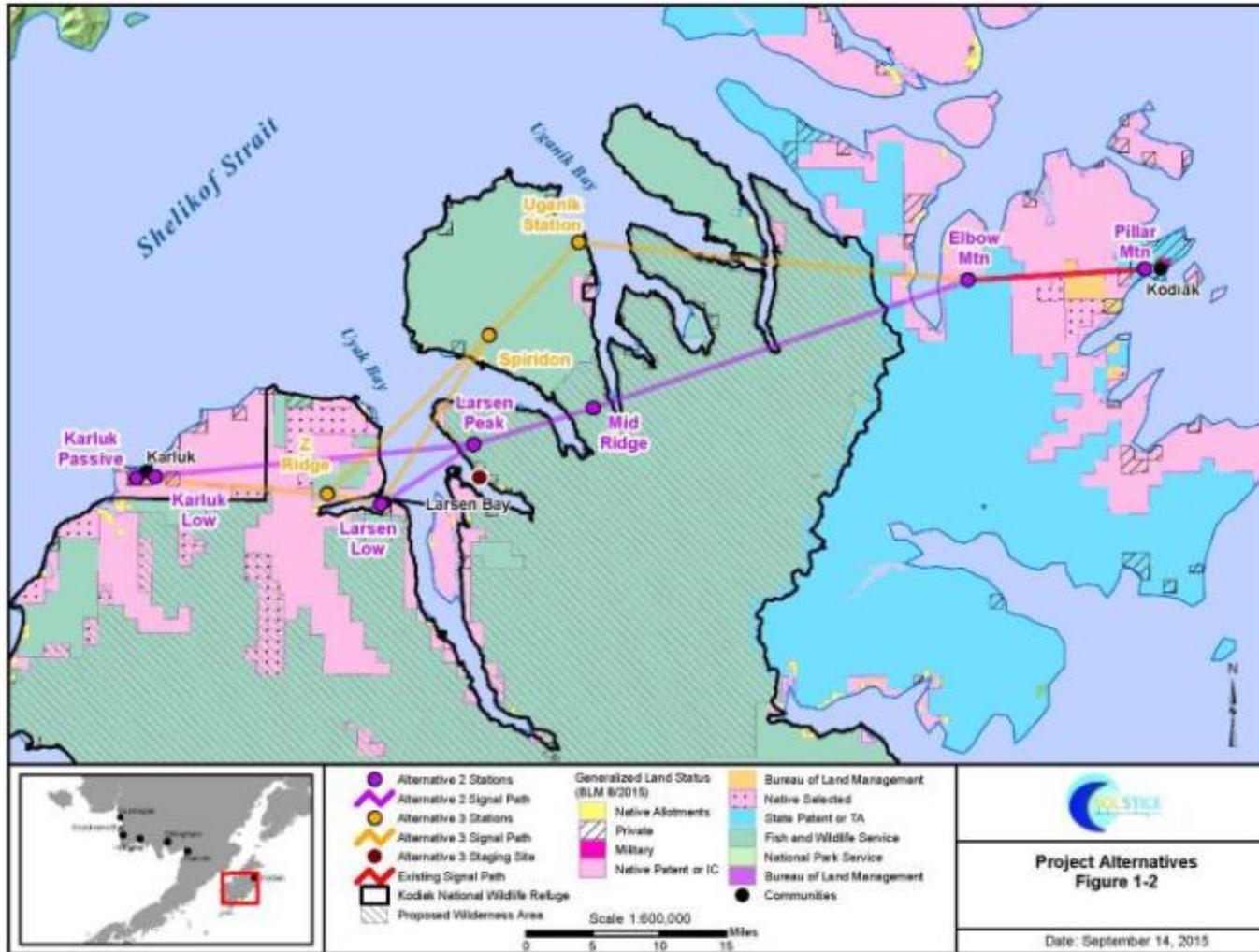
As originally proposed, one tower would be located at Larsen Peak and another at Midridge Alternative 2 (Inner Route). In addition to the no action alternative, an additional alternative to build three towers closer to the coast at Spiridon, Uganik, and Z-Ridge has also been evaluated Alternative 3 (Outer Route). Construction of the project would occur in summer of 2016. Currently there are no developments on Midridge or Larsen Peak. Spiridon and Z-Ridge currently host a FWS radio repeater. If approved by the FWS, a Federal right-of-way (ROW) would be granted to KMS to build the telecommunication sites in the Kodiak Refuge along one of these two routes (Figure 1).

## **Preliminary Preferred Alternative Selection**

After evaluation of the project and alternatives, the *preliminary* preferred alternative has been determined to be Alternative 2 (Inner Route), the originally proposed action to build towers at Midridge and Larsen Peak. Although the towers in Alternative 2 would be located in lands with wilderness values, the towers would be less visible, further from critical sea lion haul-outs and seabird colonies, and require many fewer helicopter trips for construction and maintenance over the life of the project than the tower sites evaluated in Alternative 3 (Outer Route).

This preliminary decision is predicated on a final National Historic Preservation Act Section 106 determination of “no adverse effect” for the Village Islands staging area.

Figure 1-1 Map of Proposed Action (Preferred/Inner Route or Alternative 2) and Outer Route (Alternative 3)



### 1.1 PURPOSE AND NEED

The purpose of this Environmental Assessment (EA) is for the FWS to respond to the application filed by KMS. In compliance with the National Environmental Policy Act (NEPA), the Alaska National Interest Lands Conservation Act (ANILCA, 16 USC 51), and the National Wildlife Refuge System Administration Act (16 U.S. C. 668dd-668ee), FWS will evaluate the decision whether or not to issue a ROW permit to build and maintain telecommunication towers on the Refuge. This EA will provide sufficient evidence and analysis for determining whether there is potential for significant impact, thus requiring an Environmental Impact Statement, or whether there is justification to prepare a Finding of No Significant Impact (FONSI).

While the KMS4 Project includes additional components to be installed on State of Alaska and private lands, these other components are not the direct actions for which the ROW application is under review in this EA. Under the analysis of cumulative effects for this project, the contribution of all the project components, as well as other activities in the area, will be reviewed in order to understand the overall effect of this action on the human environment.

### 1.2 CRITERIA BEING USED TO EVALUATE THE PROJECT

<b>Kodiak Microwave Systems LLC Project Objectives</b>	<b>U.S. Fish &amp; Wildlife Service Project Objectives</b>
The project must cost less than \$5 million.	No new invasive species will be introduced to the Refuge.
The towers must have a line of site route with distances less than 35 miles between towers.	Changes to the natural characteristic of the interior refuge will be minimized.
Placing towers on lower ridges is preferable due to the lower maintenance costs.	There will be no new developments in primary bear habitat and disturbance to denning bears will be minimized.
	Disturbance to bird nesting habitat will be minimized.

### 1.3 KEY ENVIRONMENTAL REQUIREMENTS & INTEGRATION OF OTHER ENVIRONMENTAL STATUTES & REGULATIONS

FWS reviews ROW applications under the terms of the National Wildlife Refuge System Administration Act of 1966 (16 U.S. C. 668dd-668ee) as amended, and the regulations found at 590 CFR Part 29. Additional requirements concerning a transportation and utility system within a National Wildlife Refuge are considered under the Alaska National Interest Lands Conservation Act (ANILCA) (16 U.S. C. 3161 et seq.). These acts are described below along with other key environmental requirements that must be taken into consideration when evaluating the permit request.

*The National Wildlife Refuge System Administration Act of 1966, as amended by the National Wildlife Refuge System Improvement Act of 1997, 16 U.S.C. 668dd-668ee (Refuge Administration Act) serves as the "organic act" for the National Wildlife Refuge System. The*

act, as amended, consolidated the various categories of lands administered by the Secretary of the Interior (Secretary) through the FWS into a single National Wildlife Refuge System. The act establishes a process for determining compatible uses of refuges, stating that first and foremost, that the mission of the National Wildlife Refuge System be focused singularly on wildlife conservation, and reinforces and expands the compatibility standard of the Refuge Recreation Act.

In deciding on issuance of the ROW for use of Kodiak Refuge lands, under the Refuge Administration Act, the Kodiak Refuge Manager must make a determination that the proposed action would not materially interfere with nor detract from the mission or purposes for which the Kodiak Refuge was established. This determination is included in Appendix E.

The *National Environmental Policy Act of 1969* (NEPA) requires federal agencies to integrate environmental values into their decision-making processes by considering the environmental impacts of their proposed actions and reasonable alternatives to those actions, including a no action alternative. This Environmental Assessment addresses the administrative action by FWS to permit the location of telecommunication facilities within the Kodiak Refuge.

The *Alaska National Interest Lands Conservation Act*, or ANILCA, is key to how this project will be evaluated. When ANILCA was passed in 1980 the Act re-designated Kodiak Refuge, required the identification of federal actions which have the potential to significantly restrict subsistence users, and required FWS to complete a specific analysis of impacts and alternatives when considering the installation of a utility system within a federal conservation unit.

Although Kodiak Refuge was originally established in 1941 to “protect the natural feeding and breeding ranges of the brown bears and other wildlife on Uganik and Kodiak islands,” in 1980, Title III of ANILCA re-designated the Refuge with direction to manage for the following purposes (USFWS 2006):

- “To conserve fish and wildlife populations and habitats in their natural diversity including, but not limited to, Kodiak brown bears, salmonoids [sic], sea otters, sea lions and other marine mammals and migratory birds.
- To fulfill international treaty obligations of the United States with respect to fish and wildlife.
- To provide the opportunity for continued subsistence uses by local residents consistent with the primary purposes of the Refuge.
- To ensure water quality and necessary water quantity within the Refuge.”

In Title VIII, Section 810, Congress recognized the importance of federal lands to local residents of Alaska who had been using those lands to support their subsistence lifestyle for generations. As a result, federal land managers are required to identify whether a proposed land management action has the potential to significantly restrict subsistence opportunities. If so, then the manager is required to consult with local subsistence users and to seek to minimize such restrictions. A detailed Section 810 analysis can be found in Appendix G.

In Title XI, Congress recognized that Alaska was a comparatively young state, with incomplete transportation and utility systems. As a result, in Title XI Section 1101 (b), Congress stated that

“to minimize the adverse impacts of siting transportation and utility systems within units established...by this Act and to insure effectiveness of the decision-making process, a single statutory authority...for such systems must be provided” within which an analysis of alternatives would be conducted.

*The National Historic Preservation Act* requires federal agencies to identify and evaluate areas affected by federal actions to determine affects to historic properties and cultural resources, especially those that have the potential to be eligible for listing in the National Register of Historic Places. As part of this project, a Cultural Resources Report for this area was completed by Cultural Resource Consultants, LLC, of Anchorage, Alaska, in March 2016 and a site visit and plan was in progress during the publication of this preliminary document.

*Section 7 of the Endangered Species Act (ESA)* requires federal agencies to ensure that their actions are not likely to jeopardize the continued existence of endangered or threatened species or result in the destruction or adverse modification of the critical habitat of such species. An informal intra-agency consultation was completed by FWS April 2016, confirming that no ESA species under their jurisdiction would be likely to be affected by the project (Appendix C). Because the overall project includes a coastal staging area, a letter was sent to the National Marine Fisheries Service to confirm that no species under their jurisdiction would be likely to be affected by the project (Appendix D).

*The Wilderness Act of 1964* describes lands that meet the legal definition of Wilderness and how they should be managed. Although there are no Congressionally-designated Wilderness areas on Kodiak Refuge, the Inner Route Alternative would place two tower sites within an area that has been noted for its wilderness characteristics and was found eligible for Wilderness designation in the 1987 Comprehensive Conservation Plan (CCP) for Kodiak Refuge (USFWS 1987) and carried forward to the 2006 Revised CCP for Kodiak Refuge (USFWS 2006).

The Department of Interior Departmental Manual 516 requires the consideration of numerous statutes, regulations, and environmental features in preparing environmental documents, including, but not necessarily limited to the following: Coastal zone management (PL 92-583), Coastal barriers (16 USC 3501), Wetlands (Executive Order 11990), and Floodplains (Executive Order 11988).

#### **1.4 NON-FEDERAL PERMITS REQUIRED FOR THE PROJECT**

*Kodiak Island Borough Land Use Permits:* On July 15, 2015 the Kodiak Island Borough Planning and Zoning Commission approved the Conditional Use Permit for this project. Prior to construction, zoning compliance must be obtained from the borough.

Other components of the project are not located on FWS land but will be installed on State of Alaska and private lands. These components include three microwave towers (Larsen Low, Karluk Passive, and Karluk Low). These components are not located on federal lands, and are therefore authorized by permits issued by the State of Alaska, the Kodiak Island Borough or by agreements with private land owners.

*Alaska Land Use Permit Tidelands (Alaska State Statutes 38.05.850)*: A landing craft associated with the proposed project construction may be parked on State-owned tidelands for up to 30 days. Any commercial use equipment left overnight on State-owned land must acquire a land use permit from the State of Alaska Department of Natural Resources (ADNR) Department of Natural Resources, Division of Mining, Land and Water (DMLW).

## **1.5 AGENCY AND PUBLIC INVOLVEMENT**

Representatives from FWS, KMS, and Solstice Alaska Consulting, Inc. (Solstice) met via teleconference on May 29, 2015 to discuss the project. These representatives decided to engage the public by publishing a notice in the Kodiak Daily Mirror to allow local communities to learn about the proposed action and to submit questions, ideas, or concerns. Public comments often help to identify issues to address in the EA and to develop alternatives

To notify and involve the public in the planning process for this project a public notice was published in the *Kodiak Daily Mirror* on June 5, 2015. The notice described the project and invited comments to be received by July 6, 2015. A copy of the notice is included in Appendix A. In addition letters were sent via mail and email to all the permitted big game guides currently operating on the Refuge in June 2015. Written comments were received from three stakeholders by e-mail.

Issues raised during scoping include:

- Visual impacts of the towers
- Helicopter traffic can be very disruptive to bears as well as bear hunters. Construction should not start until May 16<sup>th</sup> instead of May 1<sup>st</sup> so as not to conflict with the spring bear hunting season.
- Benefits to the community include the availability of broadband service to a planned University of Alaska Fairbanks marine research facility at Parks Cannery
- The cost should be included so that individuals know whether they will be able to use the service

## **1.6 GOVERNMENT-TO-GOVERNMENT CONSULTATION WITH FEDERALLY RECOGNIZED TRIBES**

In compliance with Executive Order 13175, Consultation and Coordination with Indian Tribal Governments, federal agencies are required to consult with federally recognized tribal governments during the NEPA process. FWS identified tribal governments potentially affected by the project. Letters were sent to 5 identified tribal governments in May 2015 inviting them to consult on this project. No responses were received. The tribes contacted were Native Village of Larsen Bay, Native Village of Karluk, Uyak Natives, Inc., and Natives of Kodiak, Inc. A copy of a representative letter is included in Appendix B.

In addition, Koniag Native Corporation was consulted regarding the potential for traditional cultural properties in the area. No traditional cultural properties were identified.

## 1.7 SUMMARY OF ISSUES

In order to clarify the issues of greatest concern, the following two tables describe the issues being dismissed and further considered in this EA. If an issue has been dismissed, a reason is given in Table 1-1. The issue will not be discussed further in the document. Issues being further considered are listed in Table 1-2. These issues will be further discussed in Chapter 3 Affected Environment and Chapter 4 Environmental Consequences.

Table 1-1. Issues Dismissed from Further Evaluation.

AFFECTED ENVIRONMENT	REASON FOR NOT-EVALUATING
Geology	If construction occurs, four pilings per tower would be installed. For each piling, 9 cubic feet of soil and rock would be removed. This amount of soil and rock disturbance is expected to have no effect on the geology of Kodiak Island.
Air Quality	Propane generators and batteries, not diesel, would power the microwave tower sites; therefore, minimal air quality impacts would occur.
Hydrology	The project is located on uplands and is not near any waterbodies.
Wetlands & Floodplains	The project is located on mountain ridges and will not impact any wetlands or water bodies and is not located in a floodplain.
Essential Fish Habitat	The project is located on uplands and will not affect fish, fish habitat, or fishery resources.
Bald and Golden Eagles	Although bald eagles are of special conservation concern in the United States and although they are common on Kodiak Island, they do not generally occur in the proposed construction areas and no nests have been documented within ½ mile of the construction sites. Golden eagles do not occur on Kodiak Refuge.
Migratory Birds	The majority of migratory bird species will not be evaluated in this EA, because Kodiak Archipelago is not part of any major migratory pathway and is not considered a major stop-over or staging area for any migrating bird species (USFWS 2006). Seabirds, surfbirds and marbled murrelets will be considered in the EA due to their use of these lands for nesting.

AFFECTED ENVIRONMENT	REASON FOR NOT-EVALUATING
Terrestrial Mammals, Not Including Brown Bears	Only six species of land mammals naturally occur on Kodiak Island. These include: Kodiak brown bear ( <i>Ursus arctos middendorffi</i> ), Kodiak red fox ( <i>Vulpes vulpes harrimani</i> ), Kodiak American river otter ( <i>Lontra canadensis kodiacensis</i> ), little brown bat ( <i>Myotis lucifugus</i> ), short tailed weasel (or ermine) ( <i>Mustela erminea</i> ), and tundra vole ( <i>Microtus oeconomus operarius</i> ). Between the 1920s and 1960s, several species of non-native mammals were introduced to increase subsistence and recreational opportunities. Seven of these species now commonly occur on Kodiak Island. They are: Sitka black-tailed deer ( <i>Odocoileus hemionus sitkensis</i> ), mountain goats ( <i>Oreamnos americanus</i> ), reindeer ( <i>Rangifer tarandus</i> ), beaver ( <i>Castor canadensis</i> ), red squirrel ( <i>Tamiasciurus hudsonicus</i> ), snowshoe hare ( <i>Lepus americanus</i> ), and pine marten ( <i>Martes americana</i> ) (USFWS 2006). The areas being considered for development are not used by these species on a regular basis. Brown bears will be considered in the EA due to their use of these lands for denning.
Marine Mammals, not including Sea Lions and Sea Otters	The construction of this project is located on uplands and will not generally affect marine mammals. Although, because the staging area is located on a private parcel next to designated critical habitat of Steller's sea lions and northern sea otters, these species will be considered.
Transportation	The project would not affect existing transportation infrastructure and operations.

Table 1-2. Issues Considered for Further Evaluation.

AFFECTED ENVIRONMENT	REASON FOR FURTHER EVALUATION
Soils	Although the overall geology of Kodiak Island would not be affected by either action alternative, 9 cubic feet of soil per piling would be placed on the surface leading to possible sedimentation issues. There is also possible contamination from the project with fuels being stored and used at the site during construction.
Hazardous Materials Management	Site visits in June and September 2015 did not reveal any signs of contamination and according to ADEC there are no recorded contaminated sites located near any of the proposed tower sites (ADEC 2015b). Because diesel and gasoline is being used during construction, there is a chance that a spill and therefore soil contamination could occur.
Vegetation	In any proposed development on Kodiak Refuge, there is concern that invasive species will be introduced to the site via construction equipment and personnel causing the loss of native vegetation.
Surfbird ( <i>Calidris virgate</i> )	The proposed tower sites are within the nesting habitat of the Surfbird, an uncommon Kodiak shorebird whose world-wide population is in decline.

AFFECTED ENVIRONMENT	REASON FOR FURTHER EVALUATION
Marbled Murrelet ( <i>Brachyramphus marmoratus</i> )	The proposed tower sites are within the nesting habitat of the Marbled murrelet, a FWS Bird of Conservation Concern.
Seabird Colonies	Several seabird colonies are located near the staging area on Village Islands and along the flight corridor between the staging areas and the tower sites.
Denning Brown Bears	Brown bears den in high, rocky ridges on Kodiak Island in similar habitat to that being used for the tower sites.
Threatened & Endangered Species (Sea Lions and Sea Otters)	The waters around Kodiak Island are considered critical habitat for the Steller's sea lion and northern sea otters. A letter of our determination to the National Marine Fisheries Service is included in Appendix D and documentation of informal consultation within FWS is included in Appendix C.
Cultural Resources	According to the Cultural Resources Report prepared for this project, there are no known cultural sites in the proposed tower sites, but a site plan will need to be developed for the staging area. Affects to the staging areas, which are off-Refuge will be considered under cumulative effects. A letter of concurrence will be included in the final EA.
Socioeconomic	A change to the availability of fast, reliable internet services could change the resources available for education and businesses.
Environmental Justice	Under EO 12898, Federal Actions to Address Environmental Justice in Minority Populations and Low-Income Populations, federal agencies are required to develop strategies to address environmental justice concerns in their approach to operations.
Subsistence	One of the purposes of the Kodiak Refuge is to provide opportunities for continued subsistence uses by local residents. Development of refuge lands may have an effect on local residents' participation in this activity.
Land Use	The development of tower sites in these areas would require a change to the land management status from "minimal" to "moderate" management.
Recreational Use	Lands located near the proposed tower sites are also used by commercial guides for hunting and fishing and other refuge visitors for backcountry experiences.
Lands with Wilderness Values	The Proposed Action or Inner Route Alternative places tower sites in an area considered to have wilderness values and has been determined to be eligible for Wilderness designation.
Noise/Soundscape	The proposed towers will require a significant number of helicopter flights for construction and additional flights for maintenance every 18 months. Noise, depending on the level, can be disturbing to local wildlife and individuals using the area.

AFFECTED ENVIRONMENT	REASON FOR FURTHER EVALUATION
Visual Resources	According to the 2006 Kodiak CCP “The Refuge will identify and maintain the scenic values of the Refuge and will, within the constraints imposed by the conservation plan, minimize the visual impacts of development and use of the Refuge.” The proposed towers would be unlighted, 50 feet tall, lattice towers with microwave dishes 8 to 10 feet wide. Because they will be located on ridge tops, they may affect the visual landscape.

## 2 Proposed Action and Alternatives

This chapter provides an overview of the proposed action and alternatives and notes the importance of NEPA and ANILCA Title XI in identifying appropriate alternatives to be analyzed when a utility system is proposed for installation within a National Wildlife Refuge.

### 2.1 DESCRIPTION OF THE PROPOSED ACTION AND ALTERNATIVES

The Proposed Action (Inner Route or Alternative 2) under review in this EA includes construction, operation, and maintenance of two remote microwave repeater tower sites at:

- Midridge (T29S R27W, Section 24 Seward Meridian); and,
- Larsen Peak (T30S R28W, Section 4 Seward Meridian).

The Outer Route (Alternative 3) under review in this EA includes construction, operation, and maintenance of three remote microwave repeater tower sites at:

- Uganik (T27S R27W, Section 24 Seward Meridian);
- Spiridon (T28S R28W, Section 26 Seward Meridian); and,
- Z Ridge (T30S R30W, Section 27 Seward Meridian).

These two alternatives, plus a No Action Alternative (Alternative 1), are described in detail in the next sections, followed by other alternatives considered but dismissed. The final determination as to economic feasibility will be made as part of the ANILCA Title XI determinations to be included in the FWS decision document, and not included in this EA.

### 2.2 NO ACTION – ALTERNATIVE 1 (NO ACTION ALTERNATIVE)

Under the no action alternative, FWS would not grant a ROW and the existing satellite internet service would continue. In this EA, this alternative is also used as a baseline for which to compare changes to the human environment by the action alternatives.

### 2.3 SITE DETAILS COMMON TO BOTH ACTION ALTERNATIVES

While the Inner (Alternative 2) and Outer (Alternative 3) Routes differ by the number and location of tower sites, the actual tower design is almost identical for each location. When fully installed, each microwave site would include components as described in Table 2-1. After installation of the facilities and during operations, an area of 14,400 square feet (sq ft) (120 ft × 120 ft = 0.33 acres) would be affected at each site. Additional components of the KMS Project,

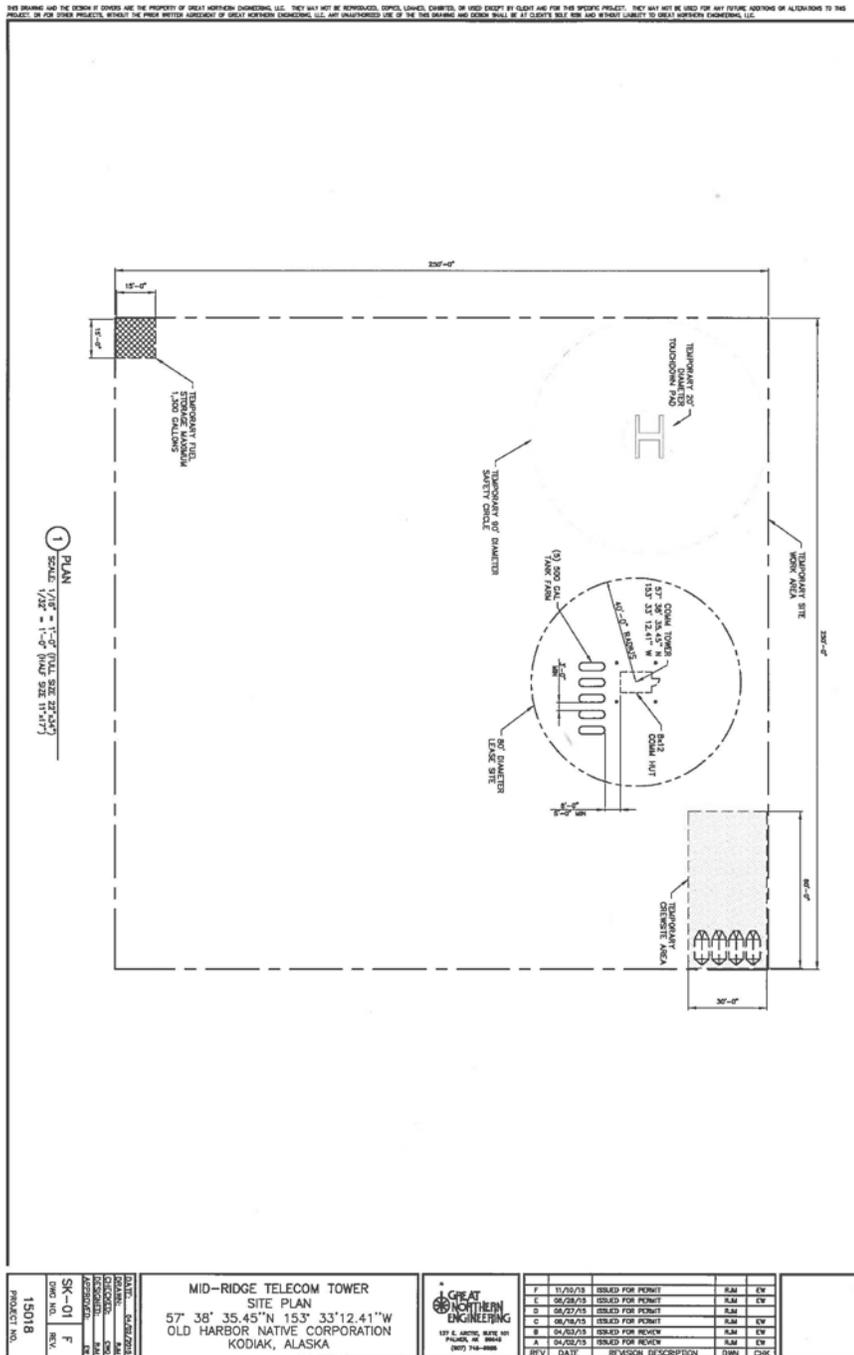
reviewed only in relation to cumulative effects and not subject to analysis in this EA, include a microwave station near Karluk, stations in the communities of Larsen Bay and Karluk, and associated infrastructure installed on non-federally-managed lands. Differences between the action alternatives are explained in Section 2.6.

**Table 2-1. Description of Microwave Site Facilities Common to Both Action Alternatives**

<b>Facility</b>	<b>Dimensions</b>	<b>Description</b>
Lattice tower	50 ft tall	The lattice tower design is a four legged free standing tower that does not require guy wires. The tower would be covered in a neutral colored galvanized coating and would not be lit. Lattice design requires that each corner have a foundation installed using micro-pile foundation: 6-8-inch diameter holes drilled in to varying depths dependent on substrate (generally ranging from 15-25 ft below ground surface [bgs]).
Antenna Color	Neutral	To make the antennas less visible, any antennae will be a neutral color to blend in with the sky and background.
Communications equipment shelter	8 ft by 12 ft	All equipment would be housed in a locked shelter. The shelter would be prefabricated and mounted on foundation piers. It would have a tan fiberglass and aluminum exterior.
Ice bridge utilidor	2 ft wide by 8 ft long	A link between the tower and the communications equipment shelter would be installed in a grate box suspended about 8 ft above ground. The box would shield the lines from ice and animal damage.
Generators	N/A	Propane fuel cell generation would be used to charge a 25 cell nickel-cadmium (Ni-Cd) battery plant (2 volt). The battery generator would be located on a 3 ft by 4 ft concrete pad within the communications equipment shelter. A separate reciprocating propane generator would be housed on a 3 ft by 4 ft pad inside a separate self-enclosure just outside the communications equipment shelter.
Propane tanks	Five tanks each holding 500 gallons	The active microwave sites would house a maximum of five 500-gallon Trinity propane tanks (2,500 gallons total) at any given time. The tanks would have a built in automatic shut off valve in case of leaks.
Piping	N/A	Propane lines would be buried under ground and would be steel hardline plumbed into the propane tanks and generators.

A schematic drawing of one of the proposed tower sites is included below (Figure 2-1). Figure 2-2 shows a site similar to those proposed for this project.

Figure 2-1. Representative schematic drawing of construction sites.





**Figure 2-2. A microwave tower site similar to those being proposed for construction on Kodiak Refuge.**

## **2.4 CONSTRUCTION DETAILS COMMON TO BOTH ACTION ALTERNATIVES**

During construction, a 250 ft by 250 ft (62,500 sq ft or 1.43 acres) area would be affected at all alternative sites. Table 2-2 describes temporary construction facilities associated with installing the microwave stations. Equipment proposed to construct the communication facility was selected based on the construction requirements and the weight restrictions of the available helicopter model planned carrying the load and were specified to minimize equipment size and amount of equipment mobilized on site. The following equipment (or equivalent) would be used during construction:

- To install the tower and communication hut foundations, a small hydraulic track drill (“Geoprobe”) or a small handheld drill which uses hydraulic power for rotation and percussion (“Atlas-Copco Hydraulic LHD 23M”) would be used.
- A “Digger 50” excavator powered by a Honda GX 340 motor would be used for levelling out areas of the site where foundations are needed including the tower and communications equipment shelter.
- A 4-wheel drive 8 cubic ft powered wheel barrow (Power Barrow) powered by a Honda GXV 160 engine would be used for moving material around the site.

Construction details that differ between the sites are explained in detail in Section 2.6.

**Table 2-2. Description of Construction Facilities Common to Both Action Alternatives**

Facility	Dimensions	Description
Off-refuge staging area	N/A	A material barge would carry materials and equipment from Kodiak to the off-refuge staging area at tidewater. An R-66 helicopter would supply the daily transport of crew and lighter materials. A 204 Huey would support heavy lift requirements to set the tower, building materials, and equipment. (Helicopter operations described in Table 2-3.)
Helicopter touchdown area	20 ft by 20 ft	<p>Helicopters will land within the temporary construction area at both microwave stations. The area would be marked, with marking removed after construction. Each touchdown area would be surrounded by a 90-ft diameter safety circle, clearly marked with temporary aids to aviation. Given the low stature of the surrounding vegetation, no vegetation will be cleared within the helicopter landing zone.</p> <p>Other helicopter landing locations may be used outside the established touchdown areas but always within the temporary construction areas. Alternative landing locations may be used because of weather conditions or materials and equipment placement.</p>
Temporary laydown area	250 by 250 ft	The entire 250 ft by 250 ft temporary staging area would be used for storing materials and equipment.
Temporary fuel storage area	15 ft by 15 ft	Fuel will be covered and stored in containment ponds located at the off-refuge construction staging area and flown to the construction sites as needed. No more than five 55-gallon drums of diesel and three 5-gallon cans of gasoline will be at each microwave site during construction. The total fuel that will be temporary stored on site for construction activities would be about 290 gallons. The fuel will be stored in a containment pond within a temporary fuel storage area for containment purposes.
Temporary crewsite area	30 ft by 60 ft	A crewsite area would be established in a corner of the temporary work site. Tents would be placed on wooden platforms. Crews would use this area to take breaks, eat meals, and store some tools and materials. The crews would sleep in the area if weather prohibited flying back to the off-refuge staging area.

The construction season duration for the entire project is summarized in Table 2-3. Construction is expected to take approximately 14 days at each site; however, construction schedule is weather dependent and could be accelerated or delayed.

**2.5 OPERATION AND MAINTENANCE COMMON TO EACH TOWER SITE**

KMS expects two trips to each microwave site annually to perform operation checks and maintenance activities. A R-66 or Bell 204 or similar helicopter would be used. Refueling of

the propane generators would require 20 trips for R-66. Refueling would occur in one day and every 18 months. Once constructed, the life of this project is considered to be 25 years.

**2.6 SITE AND CONSTRUCTION DETAILS UNIQUE TO EACH ACTION ALTERNATIVE**

Although the construction and maintenance of each individual tower site is similar, there are important differences between the two action alternatives. These differences are outlined in Table 2-3.

**Table 2-3. Differences between the Inner Route (Alternative 2) and the Outer Route (Alternative 3)**

	Inner Route (Alternative 2)		Outer Route (Alternative 3)		
	Larsen Peak	Midridge	Uganik	Spiridon	Z-Ridge
Elevation (ft.)	2,819	2,487	1,989	2,677	2,174
Antennas	3-8'-10'	2-8'-10'	1- 8' & 1- 6'	1-8' & 1-6'	1-10' & 1-4'
Total Acres Disturbed Permanently	0.66		1.00		
Total Acres Disturbed During Construction	2.9		4.3		
Total R-66 Helicopter flights for daily transport of crew and lighter materials	100		150		
Total Bell Huey 204 flights for slinging equipment and large material	40		60		
Staging Areas	Village Islands		Village Islands and Larsen Bay Community		
Longest expected construction season	2 months		3 months		

## 2.7 IMPACT SUMMARY MATRIX

A summary of the impacts of the alternatives is presented in Table 2-4.

Table 2-4. Impact summary matrix

AFFECTED ENVIRONMENT	NO ACTION - ALTERNATIVE 1	INNER ROUTE – ALTERNATIVE 2	OUTER ROUTE – ALTERNATIVE 3
Soils	No changes to soil resources.	Negligible, direct, long-term adverse impacts would be expected. A total of 72 cubic ft. of soil would be permanently displaced over 2 sites and on each site approximately 0.33 acres would be disturbed.	Negligible, direct, long-term adverse impacts would be expected. A total of 108 cubic ft of soil displaced over 3 sites and on each site approximately 0.33 acres would be disturbed.
Vegetation	Vegetation would remain unchanged.	Vegetation would be permanently affected on 0.66 acres; 1 of 2 sites is sparsely vegetated and rocky and 2.9 acres would be disturbed. With invasive species and prevention and mitigation measures properly implemented and without accidental fuel spills, impacts would be considered minor, affecting a relatively small area, for a long duration.	Vegetation would be permanently affected on 1 acre; 1 of 3 sites is sparsely vegetated and rocky and 4.3 acres would be disturbed. With invasive species and prevention and mitigation measures properly implemented and without accidental fuel spills, impacts would be considered minor, affecting a relatively small area, for a long duration.
Hazardous Materials	No contaminants are recorded in these areas and no impacts due to hazardous materials would result.	Storage of fuels and hazardous materials onsite create risks of a release. However, containment designs and an approved SPCC plan reduce the risks. Given the limited fuel volume risks, the summary impact of a fuel spill would be considered minor.	Same as Alternative 2.

AFFECTED ENVIRONMENT	NO ACTION - ALTERNATIVE 1	INNER ROUTE – ALTERNATIVE 2	OUTER ROUTE – ALTERNATIVE 3
Surfbird ( <i>Calidris virgate</i> )	No change to current habitat.	Nesting habitat would be effected during construction in the short-term at Larsen Peak. There are no expected effects to surfbird nesting habitat on Midridge. In the long term, no effects are expected as refueling and maintenance will be limited to early spring and late summer, which is before and after the nesting season.	Nesting habitat would be effected during the construction in the short-term at Uganik site. There are no expected effects to surfbird nesting habitat on the other sites within this alternative. In the long term, no effects are expected as refueling and maintenance will be limited to early spring and late summer, which is before and after the nesting season.
Marbled Murrelet ( <i>Brachyramphus marmoratus</i> )	No change to current habitat.	No suitable nesting area along this route, therefore no change to current habitat is expected.	Nesting habitat would be effected during construction in the short-term at Uganik. There is no marbled murrelet nesting habitat on Spiridon or Z-Ridge. In the long term, no overall effects are expected as refueling and maintenance will be limited to early spring and late summer, which is before and after the nesting season.
Seabird Colonies	No change to current habitat.	Negligible to minor short term effects to nesting area from noise at Village Islands over the short term would be expected during Construction. No long-term effects are expected.	Minor to moderate short-term effects are expected to the nesting areas due to noise from dozens overflights during construction. No long-term effects are expected as maintenance and refueling will be limited to before and after nesting season.

<b>AFFECTED ENVIRONMENT</b>	<b>NO ACTION - ALTERNATIVE 1</b>	<b>INNER ROUTE – ALTERNATIVE 2</b>	<b>OUTER ROUTE – ALTERNATIVE 3</b>
Brown Bears	No change to current habitat.	Because construction is limited to after July 1 and refueling and maintenance is limited to winter and late summer, only minor, direct and indirect impacts to brown bears are anticipated. Impacts would be due to noise disturbance by helicopters traffic and construction activities.	Same as Alternative 2.
Threatened & Endangered Species (Sea Lions and Sea Otters)	No change to current habitat.	Short-term, moderate noise disturbance to feeding sea lions and sea otters at Village Islands is expected from helicopter take-off and landing from the Village Island staging area is expected over the short-term. No disturbance to haul-outs is expected.	Short-term, moderate noise disturbance at Village Islands and Larsen Bay to feeding sea lions and sea otters is expected from helicopter take-off and landing from the staging areas is expected over the short-term. Due to the proximity to Spiridon and Uganik tower sites, sea lion haul-outs at Noisy Rocks and Bird Rocks are at risk of moderate disturbance in the short term due to the number of helicopter flights in the area.
Cultural Resources	No change to historic properties.	No change to historic properties is expected at the construction sites. A final determination will be made regarding the Section 106 in the final EA.	Same as Alternative 2.

<b>AFFECTED ENVIRONMENT</b>	<b>NO ACTION - ALTERNATIVE 1</b>	<b>INNER ROUTE – ALTERNATIVE 2</b>	<b>OUTER ROUTE – ALTERNATIVE 3</b>
Socioeconomic	No change socioeconomic patterns.	Nominal beneficial economic effects are expected to the communities of Larsen Bay & Karluk from an improved internet connection.	Same as Alternative 2.
Environmental Justice	No changes to environmental justice.	No environmental justice concerns were identified.	Same as Alternative 2.
Subsistence	No change to current resources.	No effects to subsistence resources or opportunities are expected.	Same as Alternative 2.
Land Use	No change to current use.	Direct, minor adverse effects include the long-term displacement of 0.66 acres of recreational land within the Refuge. Two tower sites would be re-designated from Minimal Management to Moderate Management Areas.	Direct, minor adverse effects include the long-term displacement of 1.0 acres of recreational land within the. Three tower sites would be re-designated from Minimal Management to Moderate Management Areas.
Recreation	No change to current use.	Recreational use would have minor, indirect effects in the short-term due to multiple helicopter flights on the Spiridon Peninsula and Larsen Peak areas and indirect, long-term effects due to a change to the visual resources in the Uyak Bay and interior valleys eastward from the Spiridon Peninsula.	Recreational use would have minor, indirect effects in the short-term due to multiple helicopter flights on the Spiridon Peninsula and near the community of Larsen Bay and and indirect, long-term effects due to a change to the visual resources of the area in the long-term on the Spiridon Peninsula and Uganik Bay.

<b>AFFECTED ENVIRONMENT</b>	<b>NO ACTION - ALTERNATIVE 1</b>	<b>INNER ROUTE – ALTERNATIVE 2</b>	<b>OUTER ROUTE – ALTERNATIVE 3</b>
Lands with Wilderness Values	No change to current lands with wilderness values.	Two towers would be constructed in lands eligible for wilderness designation affecting the undeveloped and natural values of the area and they would be visible for a few miles affecting the natural values of the broader landscape.	No towers would be constructed in lands eligible for wilderness designation.
Noise/Soundscape	No additional noise.	Noise from helicopter traffic would last for up to 2 months in and around the Spiridon and Uganik Bays and would occur for a short duration (1 day) 2-3 times per year for maintenance and refueling. The overall effects to the soundscape of the area would be considered minor to moderate in the short-term and minor in the long-term.	Noise from helicopter traffic would last for up to 3 months in and around the Spiridon Peninsula and would occur for a short duration (1 day) 2-3 times per year for maintenance and refueling. The overall effects to the soundscape of the area would be considered minor to moderate in the short-term and minor in the long-term.

<b>AFFECTED ENVIRONMENT</b>	<b>NO ACTION - ALTERNATIVE 1</b>	<b>INNER ROUTE – ALTERNATIVE 2</b>	<b>OUTER ROUTE – ALTERNATIVE 3</b>
Visual Resources	No change to viewscapes.	Minor, short-term effects during construction would be expected due to numerous helicopter flights in the area. Minor, long-term effects are expected. Towers would be visible from much of Uyak Bay, the areas around Amook Island, interior valleys eastward from the Spiridon Peninsula, and the ridges around Little River Lake public use cabin, when it is rebuilt. But, although visible, the towers will not be as noticeable from areas 3 or more miles from the tower site. Towers would be easily visible from the air, possibly affecting flight seeing activities in the area.	Moderate, short-term effects during construction would be expected due to numerous helicopter flights both on the Spiridon Peninsula and Z-Ridge which is next to the highly used Karluk River. Moderate, long-term effects are expected, as the towers would be visible from much of Uganik Bay, the areas around Amook Island, interior valleys eastward from the Spiridon Peninsula, and the ridges around Little River Lake public use cabin, when it is rebuilt. Although visible, the towers will not be as noticeable from Uganik Island cabin as it is more than 3 miles from the tower sites. Z-Ridge will be easily visible from the Karluk River, a popular fishing destination. Towers would be easily visible from the air, possibly affecting flight seeing activities in the area.

## 2.8 RECOMMENDED CONSERVATION MEASURES

Conservation measures are strategies that are implemented in order to minimize the effects to refuge resources by a project being implemented on the Refuge. Conservation measures for this project are listed in Table 2-5. A full listing of the proposed ROW stipulations is included in Appendix F.

Table 2-5. Conservation Measures to be Implemented for either Action Alternative

AFFECTED ENVIRONMENT	CONSERVATION MEASURES
Soils	Placement of erosion and sedimentation controls as needed during construction and stabilization of disturbed areas during and immediately following construction will be required. Equipment use will be limited to the construction boundary shown on the site plans.
Hazardous Materials	Fuel storage, cleanup and spill reporting will be conducted in accordance with the Service policies. Absorbent material in sufficient quantity to handle operation spills must be on hand at all times for use in the event of an oil or fuel spill. A Spill Prevention Control and Countermeasure Plan (SPCC) will be developed and on site as applicable. If a spill does occur, the Refuge Manager would be notified immediately. A bond would be required of the permittee in order to ensure funding is available for any necessary contaminant clean-up.
Vegetation	Impacts associated with trampling, crushing, or collision of vegetation are to be avoided to the maximum extent possible. Staging of construction equipment and supplies will also occur in locations devoid of vegetation where possible. Construction equipment, supplies and helicopters would be inspected and cleaned as necessary prior to transport to the microwave antenna sites to minimize potential for the introduction of invasive species to the sites. During the annual maintenance visit, the site will be inspected for the growth of invasive plants. If invasive plants are found at a site; the permittee, with guidance from the Refuge, would develop and implement a plan for eradication.
Surfbirds & Marbled Murrelets	Construction and maintenance activities will be scheduled after July 1 to avoid surfbird and murrelet nesting season.
Seabirds	When possible a 1/2 mile no fly zone around seabird colonies will be in place from May 15 to Sept 15 and overflights will be at a minimum of 2000 AGL.
Brown bears	Food, food waste, and human waste will be secured during construction and removed on a weekly basis to minimize attraction of brown bears to the sites. Helicopter flights will be limited to 2,000 AGL as much as possible, and scheduling construction activities between July 1 and October 24 and maintenance and refueling between December 1 and February 28 or August 1 to October 24 so as to not disturb denning brown bears and bear hunters.

AFFECTED ENVIRONMENT	CONSERVATION MEASURES
Threatened & Endangered Species (Sea Lions and Sea Otters)	Barge traffic will remain at least three nautical miles from any sea lion haul-out or rookery during transit to and from the staging and refueling areas and helicopter traffic during construction, maintenance and refueling will remain at least three nautical miles from sea lion haul-outs.
Cultural Resources	In accordance with Archaeological Resources Protection Act (16 U.S.C. 470aa), the disturbance of archaeological or historical sites and the removal of artifacts from Federal land is prohibited. If such sites or artifacts are encountered, the Permittee will immediately cease all work upon Federal land and notify the Refuge Manager. In addition, the permittee would only be allowed to operate at the staging area in the location(s) designated by a qualified archaeologist.
Subsistence	Helicopter-supported refueling would occur during the window from December 1 to February 28 or August 1 to October 24 to avoid the most intensive hunting and fishing seasons.
Land Use	Helicopter-supported refueling would occur during the window from December 1 to February 28 or August 1 to October 24 to avoid the most intensive hunting, fishing and recreational activity period.
Recreation	Helicopter-supported refueling operations would be limited to between December 1 and February 28 or August 1 and October 24, outside the main recreational season and the towers and associated buildings should be of neutral color in order to make them blend in to the environment as much as possible.
Noise	When possible a 1/2 mile no fly zone around seabird colonies should be in place from May 15 to Sept 15 and overflights should be at a minimum of 2000 AGL. The 2000' AGL is based on FAA Advisory Circular 91-36C, "Visual Flight Rules (VFR) Flight Near Noise-Sensitive Areas." Helicopter-supported refueling would occur during the window from December 1 to February 28 or August 1 to October 24 to avoid the most intensive hunting, fishing and recreational activity period.
Visual Resources	Towers and sheds will be tan in color or with a matte finish to help them blend into the environment as much as possible.

## 2.9 ALTERNATIVES CONSIDERED BUT DISMISSED

### *Submarine Cable Alternative*

KMS investigated an alternative that involved installing a fiber optic cable on the ocean floor approximately 90 miles between the communities of Kodiak and Larsen Bay and Karluk. The route would run from a station in Kodiak northwest through Narrow Strait, across Marmot Bay and north of Whale Island, and west through Kupreanof Strait. The alternative would then run in Shelikof Strait along the northwest side of Kodiak Island past the mouths of Viekoda Bay, Uganik Passage, and Uganik Bay, and into Uyak Bay. The alternative would cross Larsen Bay and tie into a landing station in the community. A separate 30-mile long submarine cable

would run north from the Larsen Bay station through Uyak Bay, west in Shelikof Strait, and into a landing station in Karluk.

KMS dismissed this undersea fiber route from further consideration because this option is neither a reasonable nor an economically feasible and prudent alternative for providing broadband internet service to Larsen Bay and Karluk. Bathymetric and tidal current conditions between the City of Kodiak and Larsen Bay and Karluk are not well understood and a considerable amount of exploratory work and studies would be needed to prove that a submarine cable is viable. After years of study, if a feasible route were selected, construction would be difficult and require much more time to install than microwave stations. Moreover, undersea cable is difficult and expensive to repair. If the cable were to break, finding and repairing the break could take a long time and would be expensive. Repair time and expense could be further exasperated by Kodiak's inclement weather and would be very disruptive to the communities.

Although broadband can be delivered by way of laying fiber optic cable on the ocean floor, it is much more expensive. KMS estimates that installing submarine fiber cable would cost about two times more than installing microwave sites and repairs would be costly. When considering the small population size to be served (approximately 130 people), the undersea cable is cost prohibitive. For the reasons listed above, this alternative was dismissed from further consideration.

#### ***Other Microwave Alternatives***

In order to judge whether microwave alternatives are reasonable under NEPA and economically prudent and feasible under ANILCA Title XI, KMS developed a set of criteria which are listed in Section 1.2.

#### **Sheratin - Spiridon**

This alternative involves microwave transmission from an existing communication complex on Sheratin directly to Spiridon, which would eliminate the Uganik site of the Outer Route Alternative. This alternative was dismissed from further consideration because KMS had tried building a tower on this site and it was destroyed by the icing conditions created by the elevation and location of the site.

#### **Elbow Peak-Larsen Peak**

This alternative involves microwave transmission from an existing site on Elbow Peak to Larsen Peak and directly to the community of Larsen Bay. Karluk would be served via three passive microwave repeater stations. This alternative was dismissed from further consideration because there is a mountainside interference which inhibits line-of-sight along the route. This alternative would not meet the purpose and need of the Proposed Action to provide reliable broadband service in Larsen Bay and Karluk by providing high-capacity, high-speed, low delay connectivity.

#### **Japanese Bay-Peak 1**

This alternative consists of transmitting microwave by way of a microwave station in Japanese Bay to Peak 1 (also known as Frazer Peak). To serve Larsen Bay, the microwave would be

transmitted from Peak 1 to a passive repeater station near Larsen Bay and then to the community. To serve Karluk, the microwave would be transmitted via a passive repeater station into a station at the Karluk School. This alternative was dismissed from further consideration because of FWS's concerns that the Peak 1 microwave station is within important brown bear habitat.

### **Japanese Bay- Peak 3**

This alternative includes transmitting microwave from Japanese Bay to Peak 3. Larsen Bay would be served by microwave from Peak 3 via a passive repeater station outside the community. This alternative was dismissed because the Peak 3 microwave station would require a 130 ft microwave tower and because the site is above 4,000 ft in elevation. In addition, this alternative requires raising the existing tower at Japanese Bay by 30 ft. As previously mentioned, taller microwave towers are more susceptible to damage and must be supported by guy wires. In addition, high elevation locations are prone to severe weather conditions, which could damage station components and inhibit maintenance of the sites. Additional alternatives including a microwave route that served all the communities by microwave stations installed around the outside of Kodiak Island were examined; however, they proved to be neither reasonable nor economically prudent and feasible because they involve numerous microwave stations within the Kodiak Refuge and because of their substantial cost.

### ***Microwave Network Avoiding Kodiak Refuge Alternative***

As stated above, microwave towers require line of sight to each other and appropriate distances in order to meet reliability requirements. Due to technical requirements affecting the location of microwave sites and the large extent of the Kodiak Refuge, there is no opportunity to locate the towers outside of the Refuge that will support the purpose and need of the Proposed Action.

## **3 Affected Environment**

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This chapter identifies the project area and the region of influence within which the project might have impacts. In compliance with NEPA CEQ guidelines at 40 CFR 1508.9, the description of the affected environment focuses on those resource areas and conditions potentially subject to impacts. Resources to be considered in this chapter are listed in Table 1-2.

For example, impacts from helicopter noise might extend some distance from the sites. The region of influence varies depending on the nature of the resources potentially subject to impacts, which are identified as appropriate to particular resources in this document. Figure 2 shows the overall area of consideration. The Inner Route (Alternative 2) includes Midridge and Larsen Peak, and the Outer Route (Alternative 3) includes Uganik, Spiridon, and Z-Ridge.

The existing condition of a resource area is considered the baseline against which potential effects of implementing either an Action Alternative or the No Action Alternative can be evaluated.

Figure 3-1. Area of Influence (CRC, 2016)



### 3.1 Physical Environment

#### 3.1.1 Soils

All of the alternative microwave tower sites are located on Kodiak Island ridges. A geotechnical survey at the Larsen Peak site indicates that the site consists of a thin (less than 1 foot thick) layer of unconsolidated soils and organics overlying a layer of bedrock that is soft, highly fractured, and has been weathered in place. A geotechnical survey at the Midridge microwave tower site indicates that the site consists of a relatively thin mantle of moss and organics overlying volcanic ash to approximately 6 inches below ground surface. Silty gravel underlies the ash layer to a depth of at least 18 inches. Moderately weathered graywacke bedrock occurs at a depth of approximately 5 to 7 ft bgs (Shannon and Wilson 2015, Shannon and Wilson 2015a). Based on correspondence with Timothy Riebe of the Natural Resources Conservation Service on 20 January 2016, there is no site specific data available for soils at the Midridge or Larsen Peak site. However, exposed soils (vegetation removed) occurring on the site would be expected to be erodible where they occur on steep slopes.

Geotechnical surveys were not conducted at the alternative Uganik, Spiridon or Z Ridge sites. Based on correspondence with Timothy Riebe of the Natural Resources Conservation Service

on 20 January 2016, there is no site specific data available for soils at the Uganik, Spiridon or Z Ridge sites. However, exposed soils (vegetation removed) occurring on the site would be expected to be erodible where they occur on steep slopes.

### 3.1.2 Hazardous Materials

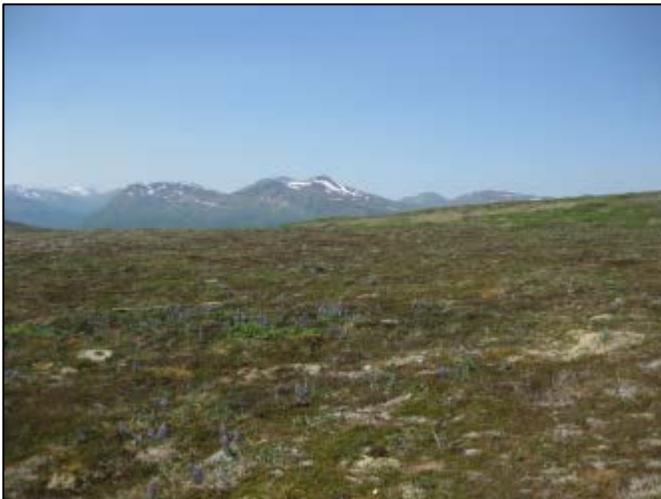
All of the alternative tower sites will require temporary fuel storage for construction and long-term propane storage as described in Tables 2-1 and 2-2. For each site no more than five 55-gallon drums of diesel and three 5-gallon cans of gasoline will be temporarily stored during construction. The fuel will be stored in a containment pond within the temporary fuel storage area. In the long-term, each active microwave site will house a maximum of five 500-gallon propane tanks. These tanks will have built-in automatic shut-off valves and propane lines between the tanks and the generators are to be buried. There are currently no known contaminants within or near the proposed tower sites.

## 3.2 Biological Environment

Within the vicinity of the proposed microwave sites, a wide diversity of habitat and wildlife exists due to the protections offered by the National Wildlife Refuge system and remote surroundings. The 1.9 million-acre Kodiak Refuge has diverse habitats encompassing 117 salmon-bearing streams, 16 lakes, riparian wetlands, grasslands, shrub lands, spruce forest, tundra, and alpine meadows. Collectively, these habitats sustain approximately 3,000 brown bears, account for up to 30 million salmon, support more than 400 breeding pairs of bald eagles, and provide essential migration and breeding habitat for another 250 species of fish, birds, and mammals (USFWS 2012). This section summarizes the biological features of concern in the project area.

### 3.2.1 Vegetation

No formal vegetation surveys were completed at the alternative microwave sites; however, short site visits were conducted in June and September 2015. Generally, all proposed microwave sites are situated in alpine terrain above the treeline at the top of wide plateau ridges.



### Midridge Vegetation

Based on the June 2015 Midridge site visit, crowberry (*Empetrum nigrum*) heath covers about 75% of the site, and moss and lichen each cover about 10% of the site. Arctic lupine (*Lupinus arcticus*) and narcissus-flowered anemone (*Anemone narcissiflora*) are also common on the site. Large-scale vegetation mapping completed by USGS for Kodiak Refuge lands classified heath as the dominate land cover on the site (USFWS 2006). Associated species

Figure 3-2. Representative vegetation on the Midridge site.

include dwarf willows (*Salix* spp.), blueberry (*Vaccinium* spp.), cranberry (*Vaccinium* spp.), Labrador tea (*Ladum palustre*), and alpine bearberry (*Arctous alpina*). The moss (*Racomitrium lanuginosum*) is a dominant ground cover. Heath grows over large areas of flat to gentle slopes of southern Kodiak Island, in stringers and patches on higher parts of alpine areas, and on dry stringers in forb meadows on steep slopes (USFWS 2006). Alpine land cover near the site includes prostrate shrub tundra, alpine heath, and alpine forb. These cover types include a mixture of bedrock, snowbank accumulation, and exposed surfaces. Sometimes, prostrate spruce (*Picea* spp.) or alder (*Alnus* spp.) form as much as 10% of the cover (USFWS 2006). Figure 3-2 provides a photograph of representative vegetation on the Midridge site.



**Figure 3-3. Representative vegetation on the Larsen Peak site.**

**Larsen Peak Vegetation**

The Larsen Peak site is primarily devoid of vegetation based on the June 2015 site visit. It has less than 10% ground cover dominated by moss and lichen with some crowberry and dwarf birch (*Betula nana*). Large-scale vegetation mapping completed by USGS for the Kodiak Refuge lands supported by the field visit, infers that the site is prostrate shrub tundra. Prostrate shrub tundra is characterized as sparsely vegetated bedrock with prostrate ericaceous shrubs, generally at high altitudes. Rock generally makes up 50% to 70% of the cover. It is usually dominated by crowberry and luetkea (*Luetkea pectinata*), with blueberry (*Vaccinium*

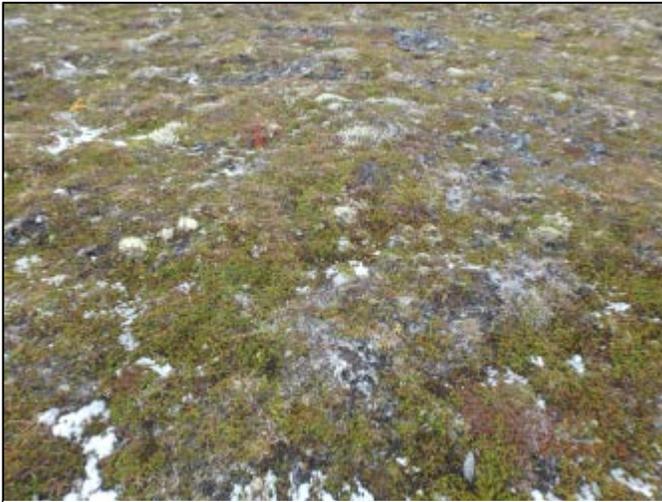
spp.), alpine azalea (*Loiseleuria procumbens*), and other mat-forming shrubs (USFWS 2006). Figure 3-3 provides a photograph of representative vegetation on the Larsen Peak site.



**Figure 3-4. Representative vegetation on the Uganik site.**

**Uganik Vegetation**

Vegetation at the Uganik site is characterized by low lying shrubs, herbs and grassy areas. Crowberry is common across the site. Moss (*R. lanuginosum*), Arctic lupine, and Hooker’s potentilla (*Potentilla hookeriana*) occur intermixed with the crowberry in places. Willows (*Salix* spp.) also occur in places on the site. Vegetation is intermixed with areas of barren soil with abundant rocks. Figure 3-4 provides a photograph of representative vegetation on the Uganik site.



**Figure 3-5. Representative vegetation on the Spiridon site.**

### **Spiridon Vegetation**

Vegetation at the Spiridon site is characterized by sparse low lying shrubs. Crowberry heath is dominant across the site. The crowberry is intermixed with moss (*R. lanuginosum*) and lichen. The vegetation is patchy and interspersed with areas of barren soil with abundant intermixed rocks. Much of the site is devoid of vegetation. Figure 3-5 provides a photograph of representative vegetation on the Spiridon site.

### **Z Ridge Vegetation**

The area to the north and east of the Z Ridge site in proximity to the existing repeater is characterized by barren rock. Vegetation over

the remainder of the site is characterized by low lying shrubs, herbs, moss and lichen. Alpine bearberry is common and occurs intermixed with crowberry, blueberry (*Vaccinium* spp.), willow (*Salix* spp.), and other shrubs. Arctic lupine and moss (*R. lanuginosum*) are also common across the site. Figure 3-6 provides a photograph of representative vegetation on the Z Ridge site.



**Figure 3-6. Representative vegetation on the Z Ridge site.**

### **3.2.2 Surfbirds**

Surfbirds (*Calidris virgate*) were observed at the proposed Larsen Peak site in June 2015. These shorebirds are a member of the sandpiper family. Surfbirds travel to Alaska in late spring to nest on barren, rocky tundra above the treeline. Nest sites, which have been confirmed in the Kodiak archipelago (MacIntosh 2009), are typically on the ground, in a natural depression on rocky surfaces of high, barren, dry ridges, and in areas surrounded by very low ground cover (National Audubon Society 2015). Surfbirds are generally uncommon, but population numbers are stable. The presence of surfbirds in the Kodiak Refuge during all seasons is “uncommon” which is described as, “...usually present in relatively small numbers, or higher numbers unevenly distributed; sighting likelihood fair” (MacIntosh 2009). Worldwide, the surfbird population is declining (BirdLife International 2012). According to the U.S. Shorebird Conservation Plan Partnership, the surfbird is considered moderately vulnerable to climate change and warrants periodic monitoring and evaluation, but is not on Watch List 2014 (U.S. Shorebird

Conservation Plan Partnership 2015). The species is an International Union for Conservation of Nature species of “least concern” because the population size is large and is not decreasing rapidly (BirdLife International 2012).

The Alaska Shorebird Conservation Plan (Alaska Shorebird Group 2008) identifies the surfbird as a priority species during the breeding season in Western Alaska (Bird Conservation Region 2). The species incubates eggs in June and attends to nestlings until late-July. Due to the remote isolated nesting locations, few systematic breeding biology studies have been conducted, but it is estimated that on the mainland north of Kodiak Island in Lake Clark National Park and Preserve in appropriate ridgetop habitat that the breeding population density is three birds/kilometers<sup>2</sup>. The surfbird has a relatively small population (70,000) more than 75% of which breed in Alaska (Senner and McCaffery 1997). Given Western Alaska’s importance to this species during the breeding season, effort should be made to prevent disturbance at tower sites, particularly in June and July.

### **3.2.3 Marbled Murrelet**

In addition to nesting in old growth forests, marbled murrelets (*Brachyramphus marmoratus*) are known to ground nest in western Alaska and the Aleutian Islands and at least 14 ground nests have been confirmed in Alaska (Denlinger 2006). A nest was found near a low ridge top at 394 ft (120 meters) elevation on Shuyak Island in the Kodiak Archipelago on 24 June 2004. Potential impacts to this species of conservation concern during the nesting season due to ridgetop development should not be dismissed. Although very little is known about ground nesting by marbled murrelets the chronology is believed to occur mid-May until the end of August.

### **3.2.4 Seabird Colonies**

The construction staging area for the Midridge, Larsen Peak, Uganik, and Spiridon sites would be located in the Village Islands south of Uganik. There is a seabird colony located in the Village Islands. Birds documented to occur or nest in the islands, based on North Pacific Seabird Colony database, include double-crested cormorant (*Phalacrocorax auritus*), red-faced cormorant (*Phalacrocorax urile*), pelagic cormorant (*Phalacrocorax pelagicus*), glaucous-winged gull (*Larus glaucescens*), black oystercatcher (*Haematopus bachmani*), Arctic tern (*Sterna paradisaea*), common murre (*Uria aalge*), horned puffin, tufted puffin (*Fratercula cirrhata*), and pigeon guillemot.

### **3.2.5 Brown Bears**

The population of brown bears on the Kodiak Archipelago is estimated at approximately 3,500 animals of which approximately 2,300 are found within the boundaries of the Kodiak Refuge. Approximately 180 to 200 of these bears use the 236 mile (380 kilometer) square Karluk Lake drainage (about 15-20 miles [24-32 kilometers] from the Alternative 2 microwave station sites), one of the densest populations of bears in the world (USFWS 2015a). In addition, high regional bear densities are found seasonally in the Uganik Alpine area, a large area where the microwave stations are proposed. According to the Kodiak National Wildlife Refuge Revised Comprehensive Conservation Plan and EIS (USFWS 2006), the Kodiak Refuge’s brown bear

population is considered healthy and its habitat secure due largely to joint conservation and management efforts by the Refuge and ADF&G (USFWS 2006).

Suitable habitat for Kodiak brown bears varies with the season. In the spring, after leaving their dens, some bears remain on alpine mountain slopes just below the snow line feeding on emerging vegetation. Bears also inhabit shoreline areas to feed on vegetation, amphipods, kelp, and carrion at this time. In the summer and into the fall, bears are found primarily along lowland stream and lake shores where they feed on salmon. Between late June and early August, bears also congregate in alpine areas in the central and northern portions of the Refuge to feed primarily on nutrient-rich sedges and forbs newly emerged after the snow melts. Berries, especially salmonberry, elderberry, and crowberry are important to the bears' diet, and they can be found where berries grow throughout the summer, including on brushy mountain slopes.

It is likely that bears routinely transit through the proposed microwave site areas; ridgelines are commonly used travel routes. However, it is unlikely that the site vicinities (i.e., 0.25 mile [0.40 kilometer] radius) support extensive foraging use because there is little preferred herbaceous vegetation forage (e.g., long-beaked sedge [*Carex sprengelii*]). Foraging that could occur would likely focus mainly on the extensively distributed crowberry and would occur in the fall after construction would be completed.

Brown bear denning characteristics have been studied in several regions of Kodiak Island (Van Daele et al. 1990, Van Daele 2007). Reproductive status and food availability were primary determinants of the duration of denning. Most den entry occurred between mid-October and mid-November in northern Kodiak Island and mid-November to mid-December in southwestern Kodiak Island. Differences in den entry timing were attributed to increased availability of food during fall. With regards to den emergence, most males emerged by May and single females and females with old cubs (>1 year-old) by June. Females with new cubs (<1 year-old) were consistently the last to emerge from dens between mid-May and mid-July (Van Daele et al. 1989, Van Daele 2007). Approximately 50% of females with new cubs had emerged by 5 June, 80% by 15 June, and 95% by 1 July (Van Daele et al. 1990).

Habitat characteristics of denning sites have also been studied (Van Daele et al. 1990, Van Daele 2007). Bears of northern Kodiak Island denned mainly on steep slopes (>45%) of alpine areas where elevations averaged 2,182 ft (665 meters) (299 – 3,900 ft [91-1,189 meters] range; n=178 dens) (Van Daele et al. 1990). Preferred microsites included relatively deep-soiled substrates that permitted den excavation in the vicinity of rock outcrops and cliff bases. Contrastingly, in southwestern Kodiak Island most bears denned mainly on moderate slopes (30-45%) of mountains where elevations averaged 1,500 ft (457 meters) (420 – 3,002 ft [128-915 meters]; n=139 dens). Microsites usually selected for bear dens typically included deep-soiled edges of mountain alder patches where tree roots probably inhibited den collapse. In his meta-analysis of bear denning in four regions of Kodiak Island, Van Deale (2007) indicated that bears used all aspects of slopes for denning; however, north aspects were preferred.

Although den locations have not been identified in the project area, it can be reasonably inferred that the general distribution of dens based on studies of denning habitat on Kodiak

Island (Van Daele et al. 1990, Van Daele 2007). It is probable that brown bears den in mountain vicinities surrounding the proposed microwave antenna sites and near proposed transportation corridors. Habitat at den sites is likely to consist of a combination of mid (mountain) slope and treeless alpine terrain of moderate to steep slope (>30%). Microsites selected as den sites probably includes deep-soiled areas in the vicinity of cliff bases, rock outcrops, or alder groves.

### 3.2.6 Marine Mammals (Steller’s sea lions and northern sea otters)

Steller’s sea lions (*Eumetopias jubatus*) were emergency listed as a threatened species under the Endangered Species Act (ESA) by the National Marine Fisheries Service (NMFS) in 1990. In 1993, critical habitat was designated for the species. The critical habitat includes all the waters west of Kodiak Island. In 1995, the species was divided into two distinct population segments, divided by the 144°W longitude line. The population surrounding Kodiak Island is within the population west of the 144°W line and is now considered endangered under the ESA. In addition Steller’s sea lions are a “strategic stock” under the Marine Mammals Protection Act and are listed as depleted (ADFG 2016). Recorded sea lion haul-outs that are within 10 miles of either barge or helicopter traffic are listed in Table 3-1.

Table 3-1. Recorded Steller’s Sea Lion Haul-Outs and Approximate Distances to Project

Steller’s Sea Lion Haul-Out	Proposed Activity	Distance to nearest Haul-Out (miles)
Noisy Islands	Helicopter flights to and from staging area at Village Islands (Alt 2 & 3)	10
Noisy Islands	Barge traffic to and from Village Islands (Alt 2 & 3)	3
Noisy Islands	Helicopter flights to and from Uganik Site (Alt 3)	8
Bird Rocks	Helicopter flights to and from Spiridon Site (Alt 3)	6

The southwest Alaska Distinct Population Segment (DPS) of northern sea otters (*Enhydra lutris kenyoni*) were listed as threatened under the ESA by the FWS in 2005. The near shore waters around Kodiak Island, including Village Islands, were designated as critical habitat in 2009. The status of the northern sea otter was reviewed in 2013 and the otter population in the Kodiak zone was noted to have grown by 22%, but ultimately no change to the ESA status or critical habitat was recommended. (USFWS 2013)

### 3.3 Social Environment

There are no inhabitants in the immediate vicinity of any of the microwave tower sites (Alternatives 2 and 3). The closest permanent settlements are the communities of Karluk, located on the Karluk River, and Larson Bay, located on Uyak Bay. Karluk and Larsen Bay are located approximately 21 miles and 8 miles west of the proposed Larsen Peak site; 30 miles

and 17 miles west of the proposed Midridge site; 36 miles and 24 miles southeast of the proposed Uganik microwave site; 28 miles and 15 miles southeast of the proposed Spiridon microwave site; and 14 miles west and 4 miles east of the proposed Z Ridge microwave site, respectively. The construction staging area for the Larsen Peak, Midridge, Uganik, and Spiridon sites would be located in the Village Islands south of Uganik and the staging area for the Z-Ridge site would be located in the town of Larsen Bay. In addition to the communities, human activity in the region of influence includes seasonal and permanent subsistence fishing and hunting cabins and camps; and sport fishing and ecotourism lodges. These facilities support subsistence and recreational activities within the Kodiak Refuge and on privately owned lands and may be subject to potential socioeconomic effects associated with development of the proposed microwave antenna sites. The following discussion focuses on characteristics of the local communities including their population, economy, and income.

### **3.3.1 Cultural Resources**

#### **Karluk**

Karluk is an Alutiiq village located at the mouth of the Karluk River. Alaska Natives have populated the Karluk River for more than 7,000 years, and there are a large number of archaeological sites in the area. The first permanent community at Karluk was established in 1786 as a Russian trading post. Many tanneries, salteries, and canneries were established between 1790 and 1850. By 1900, the Karluk River was considered the greatest salmon stream in the world, and the town was home to the world's largest cannery. By the late 1930's overfishing caused many canneries to close.

#### **Larsen Bay**

Larsen Bay is an Alutiiq village located on Larsen Bay, an inlet of Uyak Bay. Alaska Natives have populated the area for more than 2,000 years, and there are a large number of archaeological sites in the area. Russian fur traders frequented the area in the mid-1700s. The bay was named for Peter Larsen, an Unga Island furrier, hunter, and guide. In the early 1800s, there was a tannery in Uyak Bay and the Alaska Packers Association built a cannery in the village in 1911 (ADCCED 2015a).

### **3.3.2 Socioeconomic**

#### **Karluk**

Currently there are no canneries on the Karluk River. The community traditionally was split across two sites, one on either side of the spit at the entrance to the lagoon. "Old" Karluk lies on the northern side, with "new" Karluk on the southern side. The village council relocated the community to its present site after a severe storm in January 1978. New Karluk is the residential core of the community, and is home to most families (ADCCED 2015).

The village has a population of 43 and 95% of residents are American Indian or Alaska Native. Of those residents 28 are over age 16. The population has declined in the last century, peaking in 1890 with over 1,000 residents (ADCCED 2015).

Approximately 71% of Karluk residents are employed, with 80% of employed residents working in local government and 20% working in the private sector. The primary non-

governmental economic activity in Karluk is sport fishing and hunting. There are six lodges in Karluk, which provide some seasonal employment for fishing and hunting guides (ADCCED 2015).

According to the *American Community Summary 2009-2013 Estimates* per capita income is \$15,435 and median household income \$19,375 (U.S. Census Bureau 2013). Approximately 17% of residents fall below the poverty level. Most residents rely heavily on subsistence hunting and fishing (ADCCED 2015).

**Larsen Bay**

The village has a population of 71 residents and 71% of residents are American Indian or Alaska Native. Of those residents, 63 are over age 16. The population has declined in the last few decades from 168 residents in 1980, to 147 residents in 1990, to 115 residents in 2000 (ADCCED 2015a).

Approximately 65% of Larsen Bay residents are employed, with 71% of employed residents working in local government, 27% working in the private sector, and 2% working in state government. The primary non-governmental economic activities in Larsen Bay are commercial fishing, sport fishing and hunting. There are numerous lodges in Larsen Bay which provide employment in fishing, hunting, and ecotourism (ADCCED 2015a).

According to the *American Community Survey 2009-2013 Estimates* per capita income in Larsen Bay is \$27,791 and median household income is \$45,750 (U.S. Census Bureau 2013). Approximately 20% of residents fall below the poverty level. Most residents rely heavily on subsistence hunting and fishing (ADCCED 2015a).

A summary of the demographic characteristics of these communities is show in Table 3-2.

**Table 3-2. Demographic Characteristics of Karluk and Larsen Bay**

<b>Demographic Characteristics</b>	<b>Karluk</b>	<b>Larsen Bay</b>
Population	43	71
American Indian and Alaska Native	95%	71%
White	5%	24%
Two or More Races	0%	5%
Median age	19	44
Median household income	\$19,375	\$45,750
Income below poverty level (percent)	17.6%	20%
Unemployed (percent)	71%	35%

Sources: U.S. Census Bureau 2013 and ADCCED 2015.

**3.3.3 Environmental Justice**

The communities potentially affected by the Proposed Action are predominantly Alaska Native, with lower incomes than Alaska and U.S. averages. As a result of these socioeconomic characteristics, the analysis of environmental consequences of the Proposed Action and Alternatives in Section 4.4.8 (Environmental Justice) will determine whether there are disproportionate adverse impacts on these communities as a result of the proposed project.

### **3.3.4 Subsistence**

Section 803 of ANILCA defines subsistence uses as: The customary and traditional uses by rural Alaska residents of wild, renewable resources for direct personal or family consumption as food, shelter, fuel, clothing, tools, or transportation; for the making and selling of handicraft articles out of inedible byproducts of fish and wildlife resources taken for personal or family consumption; for barter or sharing for personal or family consumption; and for customary trade (16 U.S.C. § 3113).

One of the purposes of the Kodiak Refuge is to provide the opportunity for continued subsistence uses by local residents in a manner consistent with the purposes of conserving fish and wildlife populations and habitats and fulfilling international treaty obligations with respect to fish and wildlife (USFWS 2006). Within the proposed project area, each of the affected communities is characterized by active participation in subsistence fishing, hunting, and trapping on federal, state, and Native corporation lands.

#### **Subsistence Harvest Practices In or Near the Kodiak Refuge**

Larsen Bay and Karluk are Alutiiq villages. There are very few year-round employment opportunities. A large majority of the population depends on subsistence activities (ADCCED 2015 and 2015a). In 2003 (most recent available data), residents of Larsen Bay harvested a variety of salmon and marine fish, marine and land mammals, marine invertebrates, and berries. In 1991 (most recent available data), residents of Karluk harvested a variety of salmon and marine fish, marine and land mammals, marine invertebrates, and berries (ADF&G 2015b). There is also documentation of Larsen Bay and Karluk residents relying on subsistence harvest of birds and their eggs (Naves 2015). Based on information gathered by ADF&G, Larsen Bay and Karluk residents rely most heavily on salmon and non-salmon marine fish and less on marine invertebrates and large land mammals for food (ADF&G 2015b).

According to the Refuge Conservation Plan (2006), most subsistence fishing likely occurs off the Refuge and under state regulations. Deer, elk, goat, and bear hunting occurs both on and off refuge lands. As noted previously, there are federal subsistence hunting regulations for deer, elk, and brown bear, although elk are not present on Kodiak Island where the project is located. All goat hunting occurs under state regulations (Williams 2003).

### **3.3.5 Land Use**

With the exception of existing repeaters on the Spiridon and Z Ridge sites, which will be removed in the summer of 2016, the alternative microwave sites and surrounding landscapes are undisturbed, with no evidence of human alteration by either traditional Native or modern technology. There are no roads in the vicinity. There is one 17B easement trail west of Larsen Bay to the inlet of Karluk River that is commonly used. The predominant land uses within the region of influence include subsistence, commercial fisheries, guided fishing and hunting, and non-consumptive recreational activities such as bear viewing, hiking, camping, birding, and photography. The microwave tower sites referred to as “Larsen Peak, Midridge, Uganik, Spiridon, and Z Ridge” are on refuge lands that are designated as minimal management in the Revised Kodiak Conservation Plan (USFWS 2006).

The region of influence is used for a variety of recreational uses, especially Kodiak bear viewing, fishing, other wildlife viewing, hunting, hiking, bird-watching, and photography which attract visitors to the region. There are numerous private lodges near Karluk, Larsen Bay, and Uyak Bay that cater to recreationalists. The Kodiak Refuge maintains three public use cabins (USFWS 2015c) within approximately 10 miles or less of the proposed sites (Figure 3-7). They are discussed in more detail in Section 3.3.5 Recreational Use.

Some hunting and wildlife viewing would likely occur in the areas of the proposed microwave antenna sites because the areas do provide habitat for deer, goats, and bears. However, use would be expected to be low, particularly for guided hunting and viewing, due to the ridge top location of the tower sites.

### **3.3.6 Recreation**

The alternative tower sites and their regions of influence are located on lands within Game Management Unit 8 that are managed by ADF&G. ADF&G regulates the seasons, licenses, and bag limits (ADF&G 2015h). Access to prime hunting areas is typically by chartered aircraft, boat, and foot. Approximately eight guide use areas could be affected by project activities. Nonresident brown bear and mountain goat hunters must be accompanied in the field by a big game guide authorized to operate in the area (USFWS 2014a).

Two bear hunting seasons are open yearly, spring and fall. They are held from April 1 to May 15 and October 25 to November 30th, respectively. The number of bear hunters can be roughly quantified by the number of drawing permits issued. Permits are issued in two groups, unguided and guided. In the spring 51 unguided and 32 guided brown bear permits are issued. In the fall issued permits number 26 unguided and 16 guided. It is reasonable to assume that the number of visitors is slightly higher than the number of permits issued because commonly non-hunters also accompany the hunters.

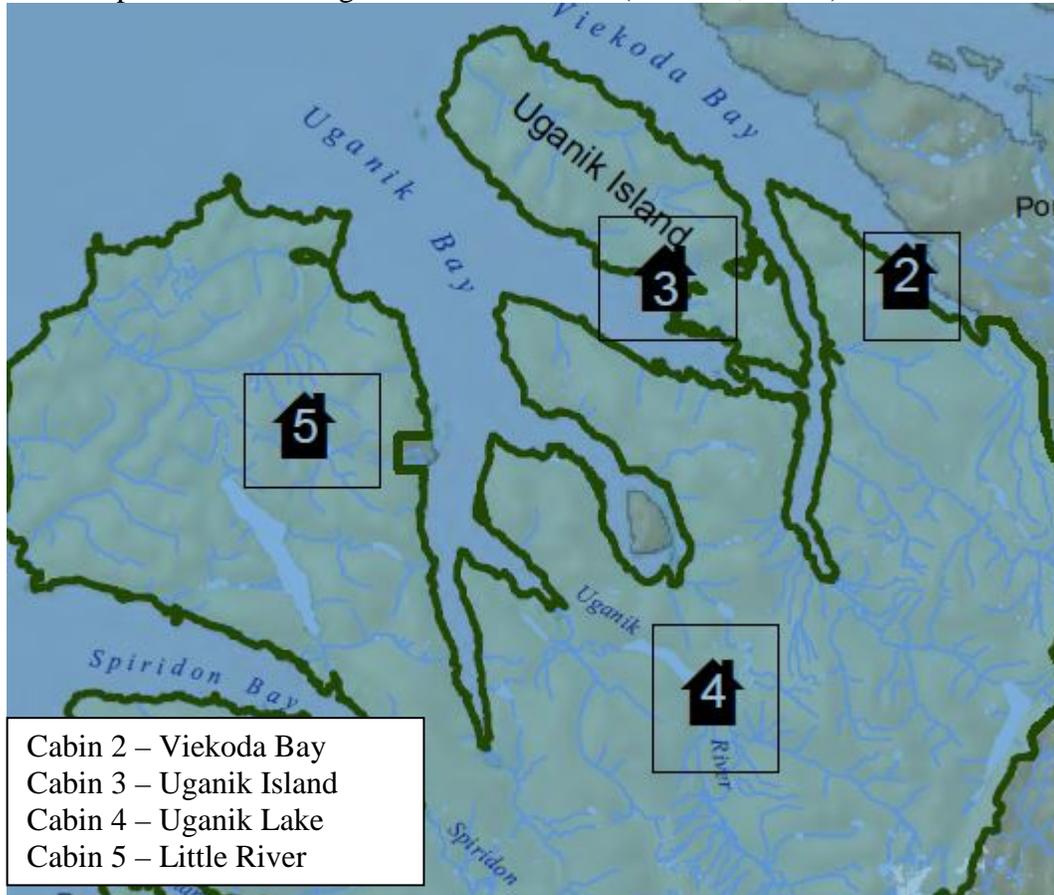
Goat and deer hunting are also popular, but more difficult to quantify than bear hunting. The hunt is administered in the project area in two areas; west and south of Spiridon Bay and drainage; and the Spiridon peninsula.

The public use cabins that are nearest to the alternative tower sites are the Uganik Lake Cabin (#4), which is approximately 9 miles east of the Midridge site, and the Little River Lake Cabin, which is approximately 10 miles northwest of the Midridge site (Google Earth 2013). The Little River Lake Cabin is located approximately 4 miles southwest of the Uganik site and approximately 5.5 miles northeast of the Spiridon site; and the Uganik Island Cabin (#3) is located approximately 9.6 miles northwest of the Uganik site. Little River Cabin (#5) burned down in 2013, and will be rebuilt in the next few years. . Table 3-3 describes which towers may be visible from which cabin and the average annual visitation to each cabin over the past 5 years. Annual visitation is measured in “visitor use days” and reported in annual use reports. A visitor use day is defined by a single person using the cabin for one day. If a party of 5 people stayed at a cabin for 2 days that would equal 10 visitor use days. Midridge and Z-Ridge sites are not visible from any public use cabins.

Table 3-3. Towers Visible from Kodiak Public Use Cabins and Average Annual Visitation (2011-2015)

	Average Annual Visitor Use Days	Larsen Peak (Alt 2)	Uganik (Alt 3)	Spiridon (Alt 3)
Uganik Island	132		X	
Uganik Lake	281			
Little River	86	X	X	X

Figure 3-7. Map of Kodiak Refuge Public Use Cabins (USFWS, 2015c)



### 3.3.7 Lands with Wilderness Values

As directed by Section 304(g) and 1317 of ANILCA the FWS reviewed all lands on Kodiak Refuge for their “suitability or non-suitability for preservation as wilderness” during the 1987 Comprehensive Conservation Plan. Four wilderness review units were identified at that time. In the updated Refuge CCP (2006), the wilderness values of those units were identified and described using the framework of the 1964 Wilderness Act (Act).

Wilderness values can be grouped in to two basic categories: those associated with wild, natural settings (the “wilderness resource, which may or may not be legally protected) and those that are specifically afforded long-term protection by formal Wilderness designation. There is no designated Wilderness on Kodiak Refuge. Therefore, only values associated with

the generally, wild, natural condition of the Refuge environment are relevant, and described here. The fundamental attributes of the wilderness resource, described in the Act, are *size, naturalness, wildness, and opportunities for primitive recreation (including solitude)*. All wilderness review units on Kodiak Refuge were found to be suitable for wilderness designation and share similar attributes of large size, a high degree of naturalness and wildness, and abundant opportunities for primitive recreation.

The Larsen Peak and Midridge sites, are located within the Zachar-Uganik and Ayakulik-Uyak Wilderness Review Units, respectively (Figure 1-1). The wilderness values of the two units are described in the Revised Kodiak Conservation Plan and Environmental Impact Statement (USFWS 2006) and are presented below. These units were found to be suitable for wilderness designation (USFWS 1987) (Figure 1-1). Currently there is no designated Wilderness on the Kodiak Refuge and the project area is located on lands that are designated as minimal management (USFWS 2006).

### **Zachar-Uganik Unit**

*Size.* This unit encompasses all refuge lands north of Three Saints Bay, but excluding Uganik Island and most of the Spiridon Peninsula

*Naturalness and Wildness (untrammelled).* Much of the rugged mountainous terrain of Kodiak Island is in this unit. Short, swift streams flowing through steep-walled valleys empty into fjord-like bays that indent the shoreline. Several small cirque and hanging glaciers are found in the area's highest elevations—the only glaciers on the Kodiak Archipelago. Many of the area's streams provide extensive spawning habitat for large runs of pink and coho salmon. The Uganik River system also provides spawning habitat for a sockeye salmon run. Prime denning and feeding habitats for brown bears are found in the area. Most of the mountain goat population on the Refuge is found here as well.

Significant numbers of deer and bear hunters and recreational anglers use the area, although most activities are concentrated along the coastline and around Uganik Lake. The Refuge maintains a public use cabin at Uganik Lake and one additional cabin on Viekoda Bay. A number of onshore facilities for commercial setnetters are located along the coastline. Impacts to naturalness and wildness from these facilities and uses are highly localized.

The Terror Lake Hydroelectric Project, located within the unit near the eastern boundary, has an impact on the natural integrity, apparent naturalness, and wildness of the Terror River watershed, especially in the immediate vicinity of the project. However, impacts to apparent naturalness are limited by the steep topography of the area, which helps hide the dam and access road except from the air and all but a few high points. Impacts to natural integrity and wildness are difficult to assess; on the scale of the whole unit, however, they are considered to be minor.

*Opportunities for Primitive Recreation.* Rugged terrain, salmon runs, and bear, deer, and mountain goat populations provide abundant primitive recreation opportunities. Seasonal concentrations of visitors near cabins and primary access points may occasionally reduce

opportunities for solitude; however, overall use is low, and most visitors can easily avoid the sights and sounds of others if they choose.

**Spiridon Peninsula-Uganik Island Unit**

*Size.* This unit encompasses approximately 151,000 acres of refuge land on the Spiridon Peninsula and Uganik Island, extending into Shelikof Strait.

*Naturalness and Wildness.* The high winds and severe weather of the Shelikof Strait are a significant influence on the Spiridon Peninsula and Uganik Island. Although they share some of the same attributes as the previously described unit, vegetation in this unit is generally more open with less shrub and brush habitats and more grasslands. The terrain, although generally steep-walled along the coastline, consists of rolling hills and less-rugged mountains. Little River is the primary salmon stream on the Spiridon Peninsula, providing spawning habitat for large runs of sockeye, pink, and coho salmon. It also supports populations of rainbow trout, steelhead, and Dolly Varden. Large numbers of Sitka black-tailed deer winter on the outer capes of the Peninsula and on Uganik Island. Two public use cabins are located in this unit: one at Little River Lake and one on the Uganik Island coast, along with onshore facilities for commercial setnetters. As in the other units, the impacts from these facilities and associated uses are highly localized.

*Opportunities for Primitive Recreation.* Severe weather, rather than rugged terrain, represents the primary challenge in this unit. The major human activity is deer hunting, which is facilitated by open vegetation and high densities of deer. Seasonal concentrations of visitors can occur at the two public use cabins, and the open terrain provides only limited screening from other users. However, ample primitive recreation and solitude opportunities exist at most times and in most places within this unit.

The Alternative 3 sites, including Uganik, Spiridon, and Z Ridge, are located outside of the eligible wilderness areas.

**3.3.8 Noise**

Sound is defined as a particular auditory effect produced by a given source, for example the sound of rain on the roof, and is measured decibels (dB). A-weighted sound level measurements (dBA) are a measure of how the human ear hears sound and is used to characterize sound levels. Table 3-4 shows dBA levels for sounds associated with the area and equipment being proposed for use in the action alternatives.

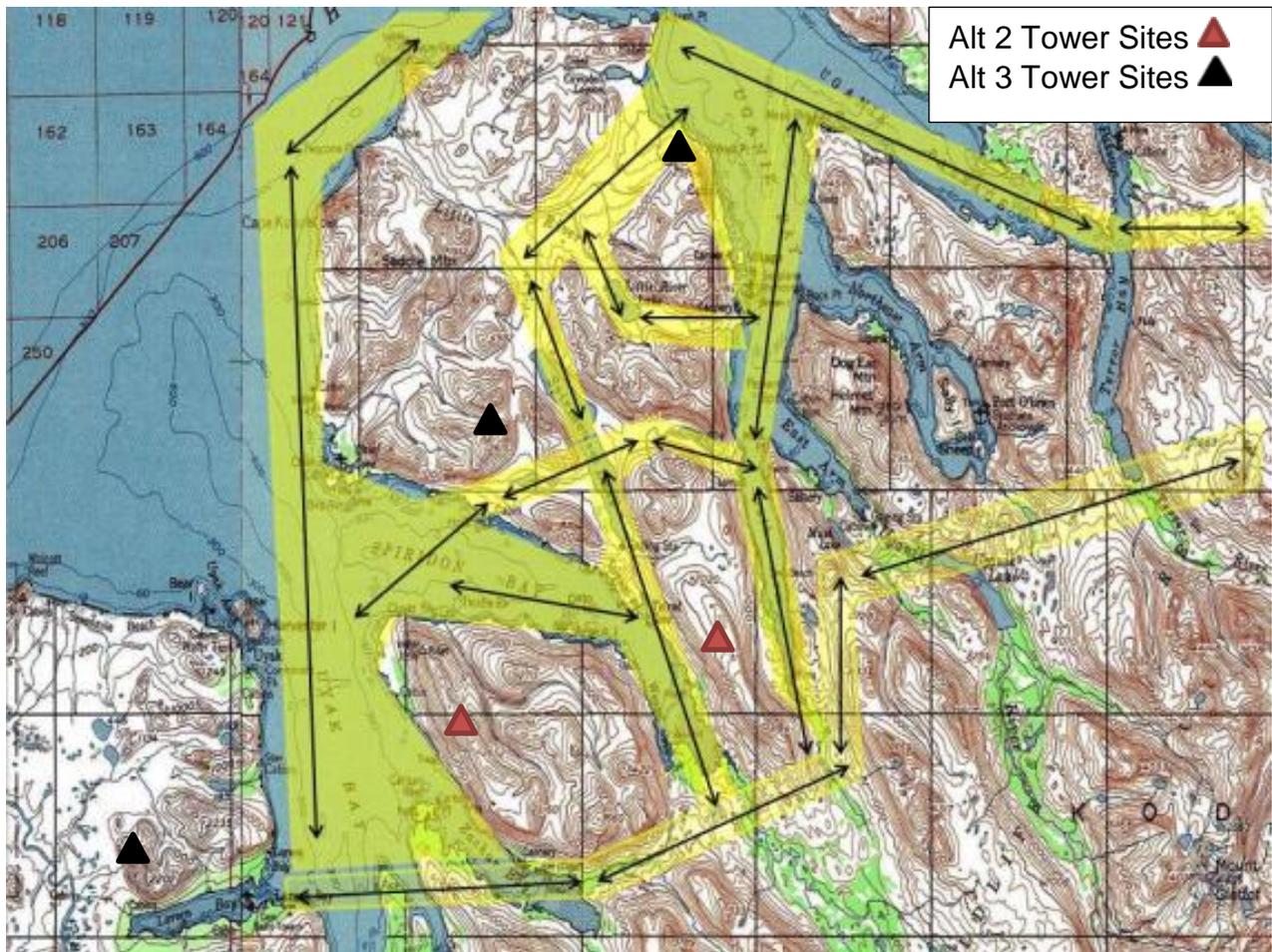
Table 3-4. dBA Levels (Bolin 2006, Illingworth and Rodkin 2006, Schulten 1997, ICAO Annex 2006, US Coast Guard 2010)

Source of Noise	dBA Level
Ambient sound without human influence	20 – 30 dBA
Ground wind 5-10 miles per hour	35 – 45 dBA
Ground wind 20 – 30 miles per hour	55 – 65 dBA
Single engine plane fly over at 1,000 ft	88 dBA
Cessna 206	79 dBA

Bell Huey 204	88 dBA
R-66	82 dBA
Propane generator at 500 ft away	30-35 dBA

Existing noise levels in and near the alternative microwave sites are generally low and from natural sources but are periodically interrupted by airplane overflights. Figure 3-8 shows the flight corridors used in the Spiridon Peninsula area. Yellow areas highlight the main flight corridors. On days where the mountain passes are covered in clouds and not passable, planes travel along the coastlines (green areas). Ambient noise levels in the vicinity of Larsen Bay and Karluk are influenced by man-made (anthropogenic) noise sources and are higher than ambient noise levels in undeveloped areas.

Figure 3-8. Aircraft flight corridors in the affected area. (Van Hatten, Pers. Comm., 2016)



Because the main source of non-ambient noise is currently from airplane overflights, it is important to understand the level of airplane use in the area. Currently, Island Air has scheduled flights to the Spiridon Peninsula area, Larsen Bay and Karluk. During the summer, when the proposed construction would occur, there are three flights per day to Larsen Bay on Monday through Saturday and two flights each week to West Point (Village Islands), Amook,

and Zachar Bay. In a two week period, this would equal 48 scheduled flights in the area. Air taxis and recreational flights are numerous during the summer moving recreationists to and from the area.

A single-engine flyover 1,000 ft above an observer may have a peak noise level of 88 dBA for a very short period, with a more extended period of lower noise levels when the airplane is at a greater distance (Schulten 1997). Noise from seaplane takeoff may result from activity at the seaplane landing area near the community; however, topography provides an effective barrier between the airport and seaplane base and the proposed tower sites.

Generally, noise levels at the alternative tower sites are expected to be between 20 and 30 dBA in calm winds and up to 40 to 50 dBA in moderate to strong winds. Noise associated with the construction staging areas at the Village Islands and Larsens Bay would be associated primarily with Bell Huey 204 and Robinson R-66 (or similar) helicopters used to support construction of the microwave antenna sites. The expected perceived noise level for a Bell Huey 204 is approximately 88 decibels (Huey 206B). The expected perceived noise level for a Robinson R-66 is 81 decibels (ICAO Annex 2006). The loudest potential sources of noise in the region of influence are airplane and helicopter overflights, and in the case of Larsen Bay and Karluk, landings and takeoffs at the village runways and Karluk's sea plane base. Because of the distance from the ocean, sound from boat operations is not expected to be heard at the proposed tower sites.

### **3.3.9 Visual**

The analysis area used to identify potential direct and indirect effects of the proposed project included all areas located within 10 miles of the project that contain views of the project towers, referred to as the "Seen Area" (Figures 3-9 through 3-18). The Seen Area is based on views during a clear day and was calculated using a Geographic Information System viewshed analysis tool using a tower height of 50 ft. The three zones (0 to 3 miles or foreground, 3-5 miles or midground, and 5-10 miles or background) were delineated to give the reader a gauge for determining distance to known areas. Areas within 5 miles are most likely to have noticeable views of the towers, although within 10 miles towers may be noticeable by a sensitive viewer. As the viewer moves away from a tower, the tower will become less and less noticeable. In the third category, 5 to 10 miles, the towers will be visible, but not noticeable with the naked eye. Because of the affects to refuge visitors, the affects to refuge recreational cabins was considered in more detail. During the construction period, helicopters taking equipment, materials, and personnel to the sites would also be visible.

Subsistence, land use, and recreational use which may be affected are described in Sections 3.3.3, Section 3.3.4, and Section 3.3.5, respectively. According to the Kodiak Refuge Conservation Plan: "The Refuge will identify and maintain the scenic values of the Refuge and will, within the constraints imposed by the conservation plan, minimize the visual impacts of development and use of the Refuge. To accomplish these purposes, all activities and facilities on the Refuge will be designed to blend into the landscape to the extent practical. The Service will cooperate with other federal, state, local, tribal, and private agencies and organizations to prevent significant deterioration of visual resources."

## **Landscape Character**

Landscape character is defined as the overall impression created by an area's unique combination of features, such as land, vegetation, water, and existing structures (cultural modification). Five viewsheds were analyzed for the purposes of this discussion. The viewsheds, centered on each of the alternative microwave tower sites, are natural in appearance, with little nearby human development. The viewsheds are described below in terms of predominant landform, vegetation, and existing structures.

### **Midridge Viewshed**

The Midridge viewshed on the top of "Midridge," an unnamed area at the neck of the Spiridon Peninsula, includes the Kodiak Mountains to the southeast, a long flat ridgeline to the north, Spiridon Bay to the west, and the South Arm of Uganik Bay to the east. The area is characterized by the dramatic visual relief of the ocean and the mountains as they rise from the ocean. Vegetation in the Midridge viewshed is dominated by alpine heath tundra. There are no trees in the immediate area; however, trees occur at lower elevations where mixed deciduous forest predominates. The Midridge viewshed is undeveloped. When viewed from the air, this area appears remote, green, and expansive, with a high degree of naturalness. There are no existing structures in the immediate area of the alternative microwave tower site.

### **Larsen Peak Viewshed**

The Larsen Peak viewshed is centered on the proposed microwave station on the top of Larsen Peak (named for this project) on an unnamed area between Spiridon Bay to the east and Uyak Bay and Zachar Bay to the west. This viewshed includes a flat plateau to the north, Spiridon Peninsula, the Kodiak Mountains to the southwest, and the surrounding ocean and islands. The ocean dominates this area's viewshed. Vegetation is limited in the Larsen Peak viewshed and the area is dominated by rocks. The vegetation present is low to the ground. Trees are visible at lower elevations. When viewed from the air, this area appears open and blue because of the surrounding ocean. There are no existing structures in the immediate area of the alternative microwave tower site.

### **Uganik Viewshed**

The viewshed of the Uganik microwave site is characterized by Uganik Bay and Uganik Island to the east and southeast and mountainous terrain to the north and west. The area is characterized by the dramatic visual relief of the bay and the mountains as they rise from the bay. The terrain on the east side of the Uganik site is very steep rising from Uganik Bay. The terrain is also very steep to the south and west of the site. Vegetation at the Uganik site is characterized by grassy areas and areas of low lying shrubs and herbs. There are patchy areas characterized by rock gravels and cobbles and barren soil intermixed with the vegetated areas. Most of the Uganik viewshed is undeveloped. The Village Islands are to the east of the site in Uganik Bay and there are a few small structures along the shoreline of the bay. There are no existing structures in the immediate area of the alternative tower site.

### **Spiridon Viewshed**

The viewshed of the Spiridon tower site is characterized by Uyak Bay and open ocean to the west, Spiridon Bay to the south and southwest, mountains to the north and Spiridon Lake to the

east. The area is characterized by the dramatic visual relief of the bays and Spridon Lake and the mountains that border the waterbodies. The general topography in the immediate vicinity of the site is characterized by a knoll with somewhat flat to moderately sloping terrain. The terrain becomes steep to very steep surrounding the flatter knoll area. Vegetation at the Spiridon site is characterized by alpine heath with abundant crowberry. Vegetated areas are interspersed with areas of barren soils with abundant rocks. Some patchy forested areas occur along the lower slopes of surrounding mountains and along drainageways. The Spiridon viewshed is undeveloped with the exception of a few small structures along the shoreline of Spiridon Bay. There is currently a small radio repeater station in the immediate area of the alternative microwave tower site which is planned for removal in 2016.

### **Z Ridge Viewshed**

The viewshed for the proposed Z Ridge tower site is characterized by low flat wet terrain associated with the Karluk River to the north; Larsen Bay to the south; mountainous terrain to the east; and to the west, the Karluk River, wet low lands associated with the river and mountainous terrain further to the west of the river. The terrain surrounding the Z Ridge site drops off steeply in all directions. The terrain to the south of the site rises steeply from Larsen Bay. The general topography in the immediate vicinity of the site is characterized by a knoll with moderate to steep slopes to the north, east, and west. A narrow ridge line extends to the south of the site towards Karluk Bay. Vegetation is limited in immediate area surrounding the Z Ridge site. The vegetation that is present is low to the ground, patchy and intermixed with abundant rock gravels. Deciduous trees occur on the lower side slopes of the mountains. Most of the viewshed of Z Ridge is undeveloped. The village of Larsen Bay is located on the south shore of Larsen Bay approximately 3 miles to the southeast of the Z Ridge site. The mountain that Z Ridge is located on is visible from Larsen Bay. A developed 17-B easement trail is located west of Larsen Bay. There is currently a small radio repeater station in the immediate area of the alternative microwave tower site which is planned for removal in 2016.

### **Viewer Sensitivity**

Visual sensitivity is defined as a measure of public concern for the scenic quality of a given area (BLM 1984) and the landscape character for each land administrative area. Visual sensitivity across the analysis area was estimated as high, medium, or low based on criteria described in BLM Manual 8410 (BLM 1984). The criteria include the following:

- Type of Users
- Amount of Use
- Public Interest
- Adjacent Land Uses
- Special Areas.

The primary viewer groups include local rural residents, commercial fishermen, and recreational/guided fishermen and hunters, and wildlife (primarily bear) viewers. Local rural residents include Alaska Native (Alutiiq) populations, Caucasian and Filipino, who rely heavily on natural resources for subsistence and therefore spend considerable amounts of time hunting and fishing in the area. Many of the subsistence users of this area also live in the viewshed of the towers in either Karluk or Larsen Bay. Commercial set net sites are dotted along the

eastern coast of Kodiak Island from Karluk to the northern end of the island near Spruce Island, especially within the Uyak, Spiridon and Uganik Bays.

Fishers, hunters, and those seeking wildlife viewing opportunities come from around the world to visit the Refuge. Several resort lodges are located in and around the community of Larsen Bay, the community of Karluk and within the Uyak, Spiridon, and Uganik Bays.

Viewer sensitivity is assumed to be high with these users because:

- The area is a highly valued recreational destination that is experienced from air, water and land;
- Visitors come to Kodiak Refuge to recreate in a primitive setting (USFWS 2006) and do not expect to see developments on the land;
- The area is used by local residents for traditional subsistence purposes which includes not only the gathering of foods but also the experience of being in their traditional landscape; and,
- The Refuge is managed for preservation of scenic quality.

Potential visual impacts must consider interference with visibility due to weather conditions. The westerly coast of Kodiak Island is not subject to the frequent fog and low lying cloud cover that is so common on the easterly coast of Kodiak Island. The difference in the two sides is significant. According to U.S. Geological Survey water resources analysis published in 1978, the easterly side of the island receives five times the precipitation that the Shelikof (westerly) side of the island receives (Jones et al. 1978).

Figure 3-9. Locations where Alternative 2 Towers are Visible

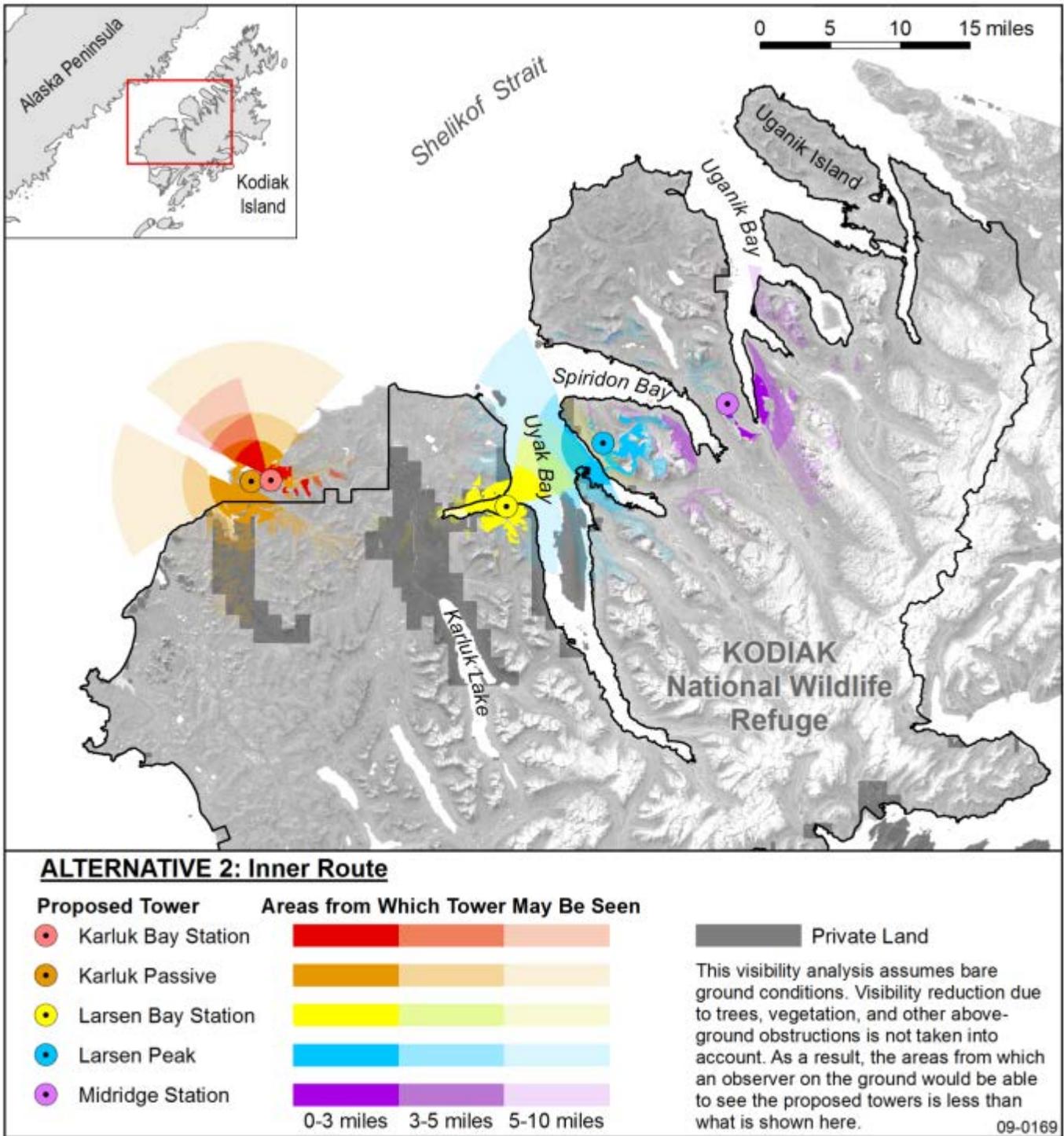


Figure 3-10. Locations where Alternative 3 Towers are Visible

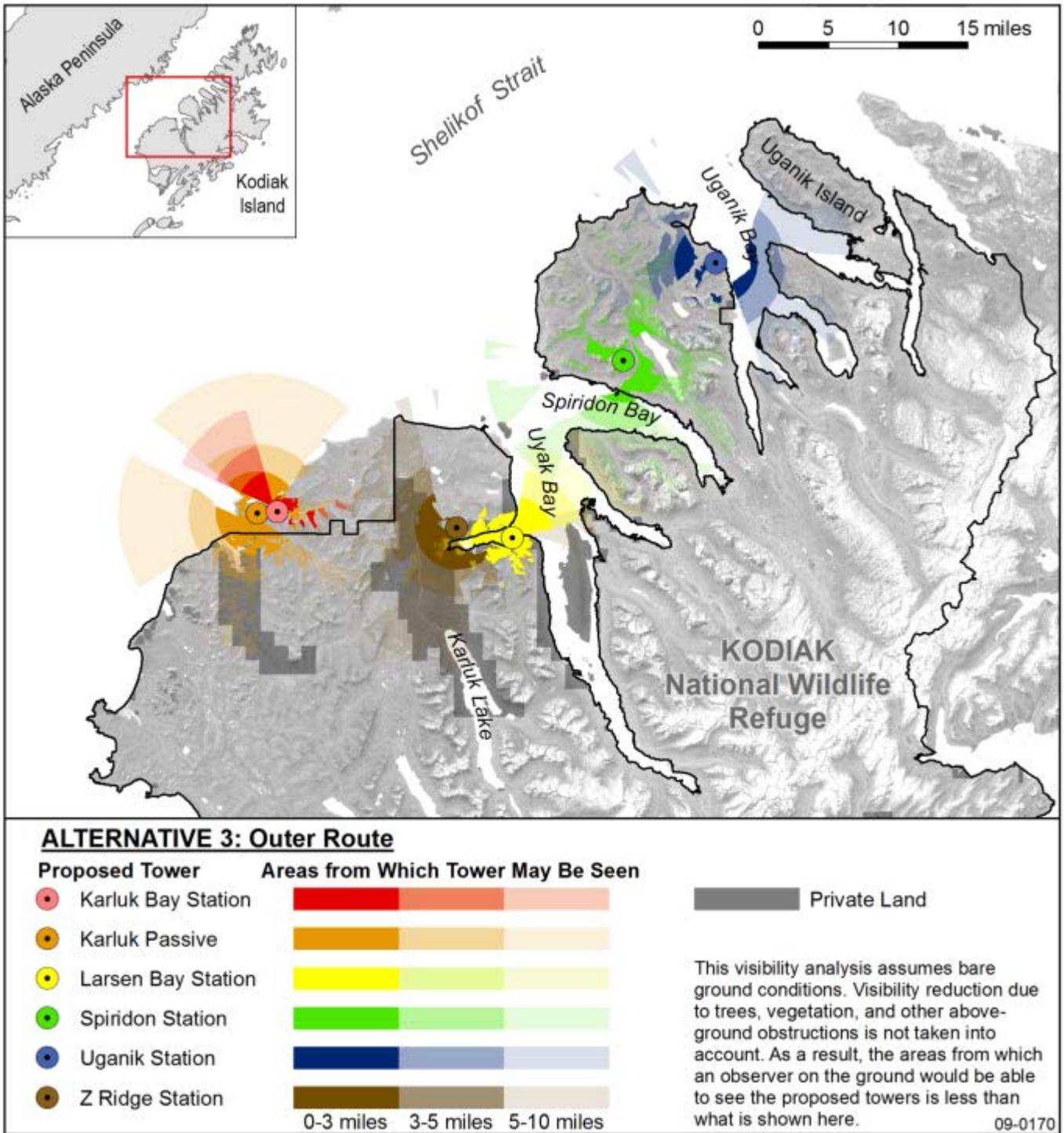


Figure 3-11. Locations where Karluk Bay Tower is Visible (off Refuge and common to Alternative 2 and 3)

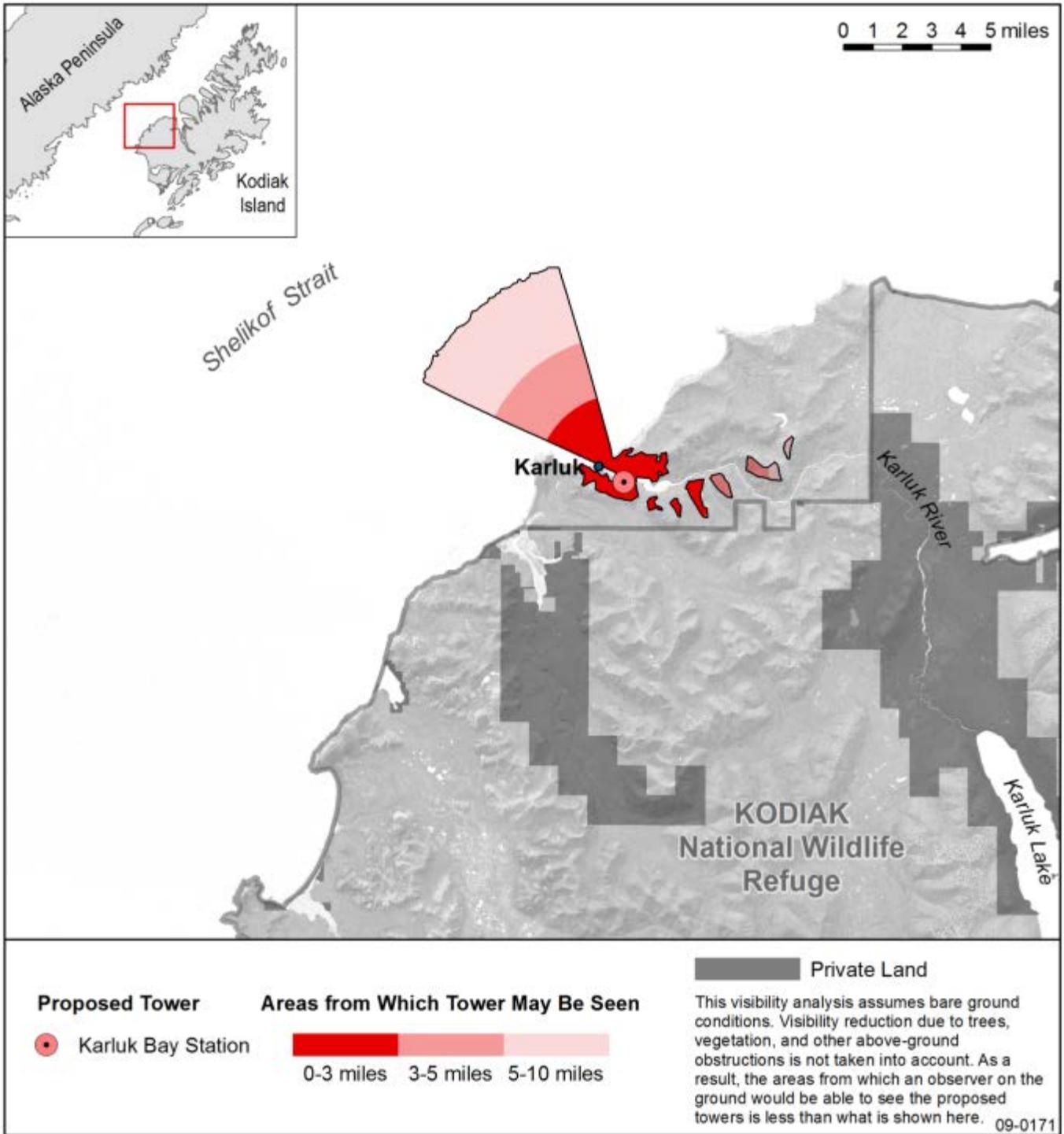


Figure 3-12. Locations where Karluk Passive Tower is Visible (off Refuge and common to Alternative 2 and 3)

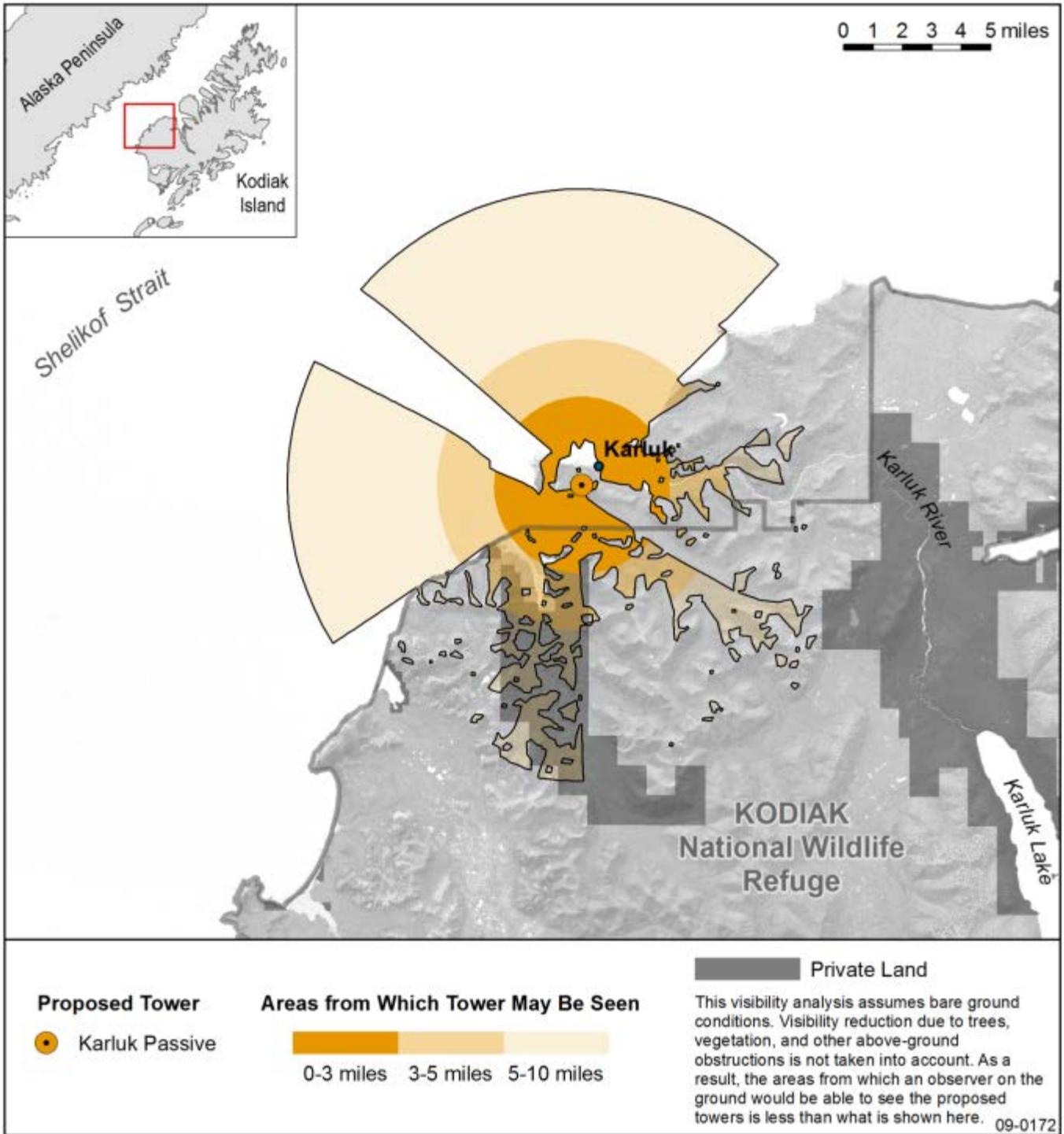


Figure 3-13. Locations where Larsen Bay Tower is Visible (off Refuge and common to Alternative 2 and 3)

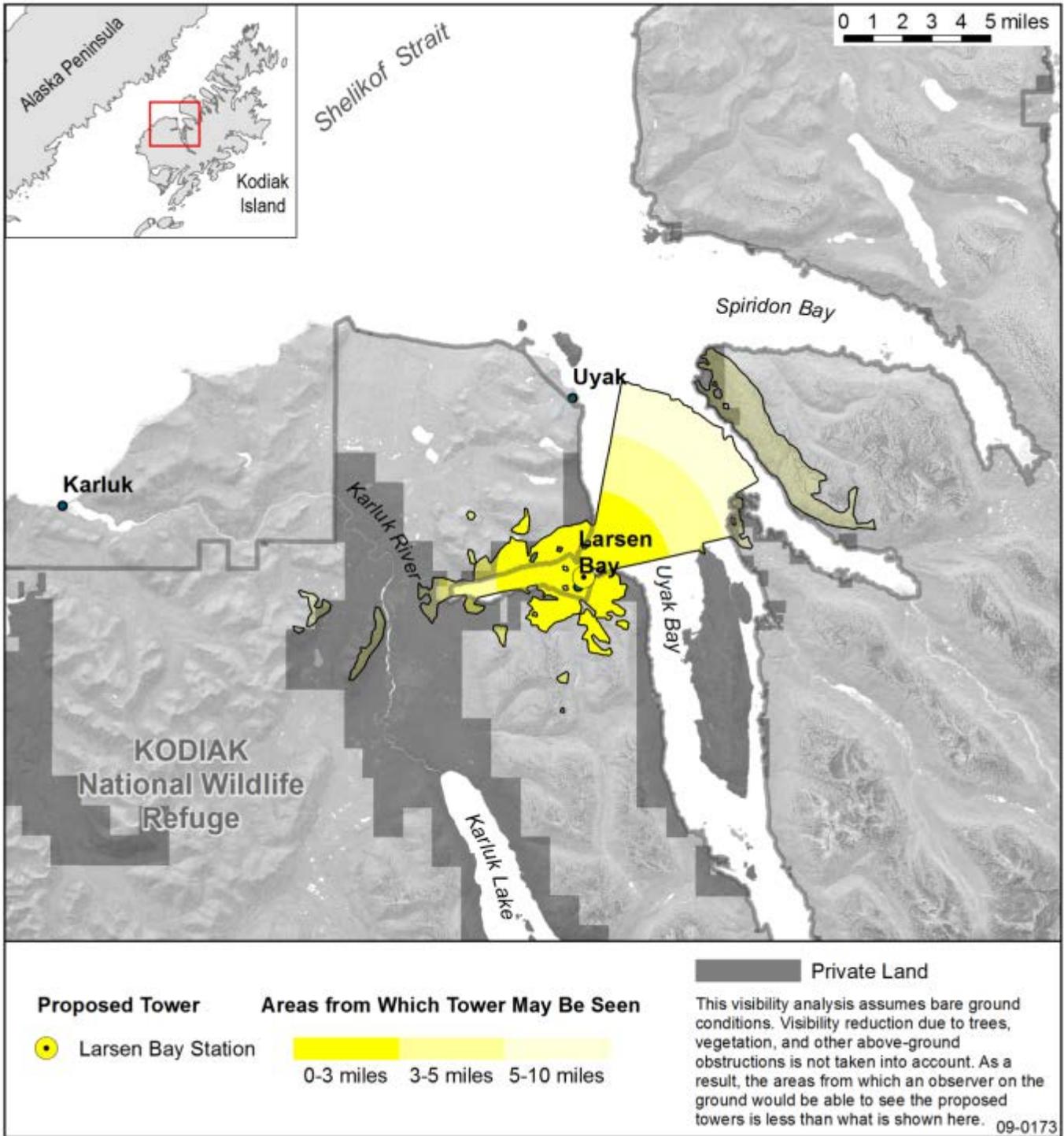


Figure 3-14. Locations where Larsen Peak Tower is Visible (Alternative 2)

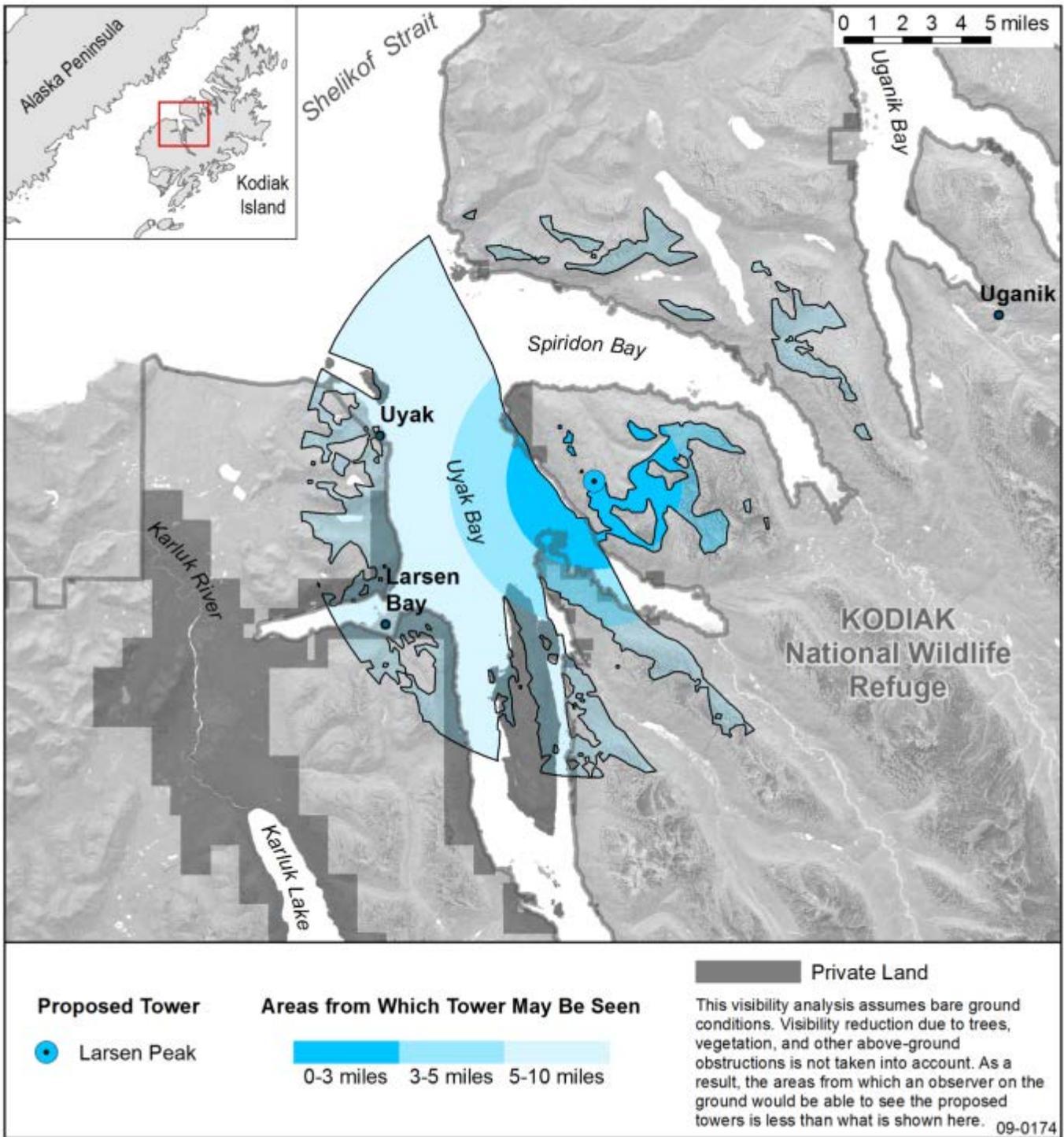


Figure 3-15. Locations where Midridge Tower is Visible (Alternative 2)

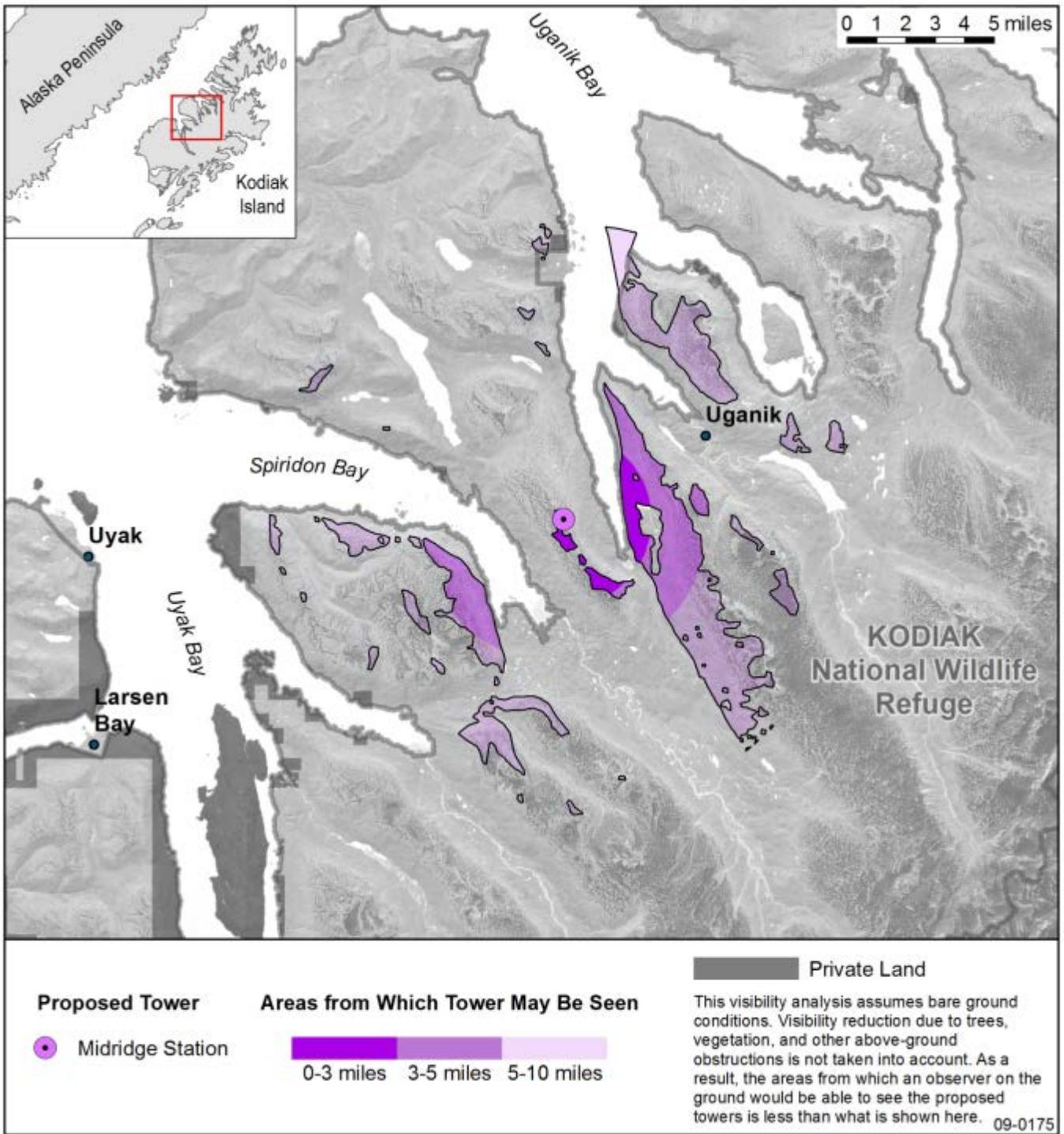


Figure 3-16. Locations where Spiridon Tower is Visible (Alternative 3)

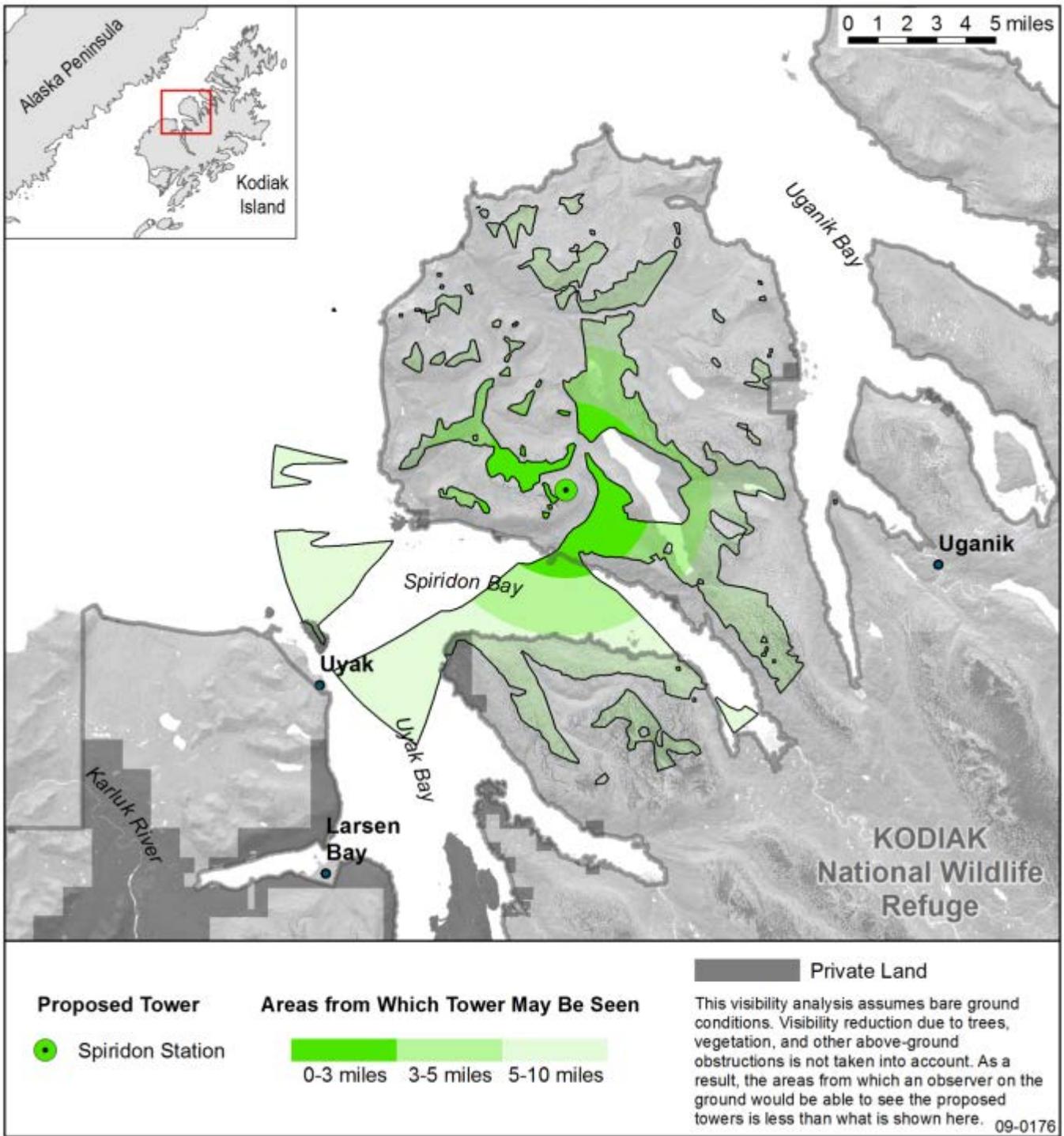


Figure 3-17. Locations where Uganik Tower is Visible (Alternative 3)

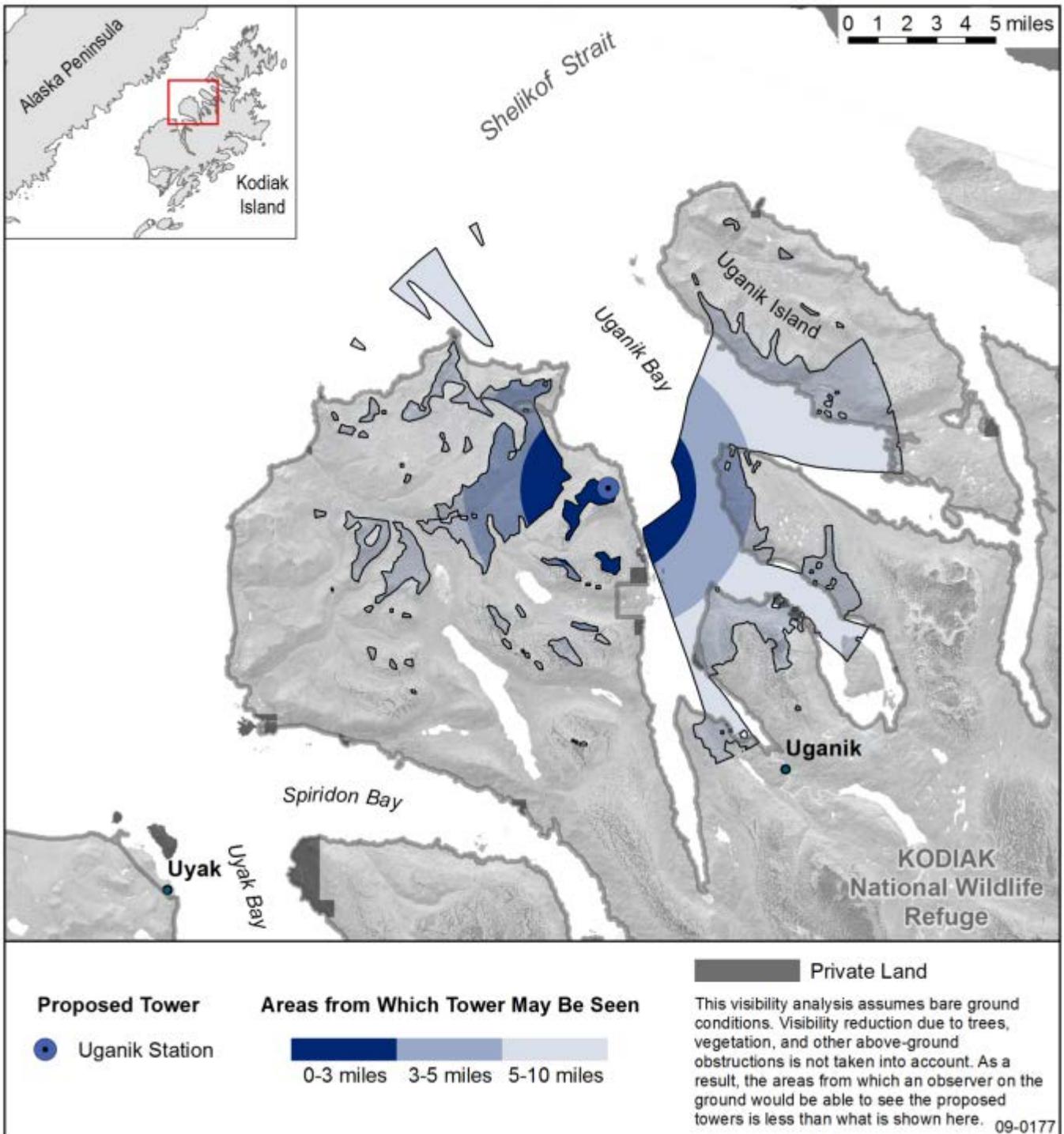
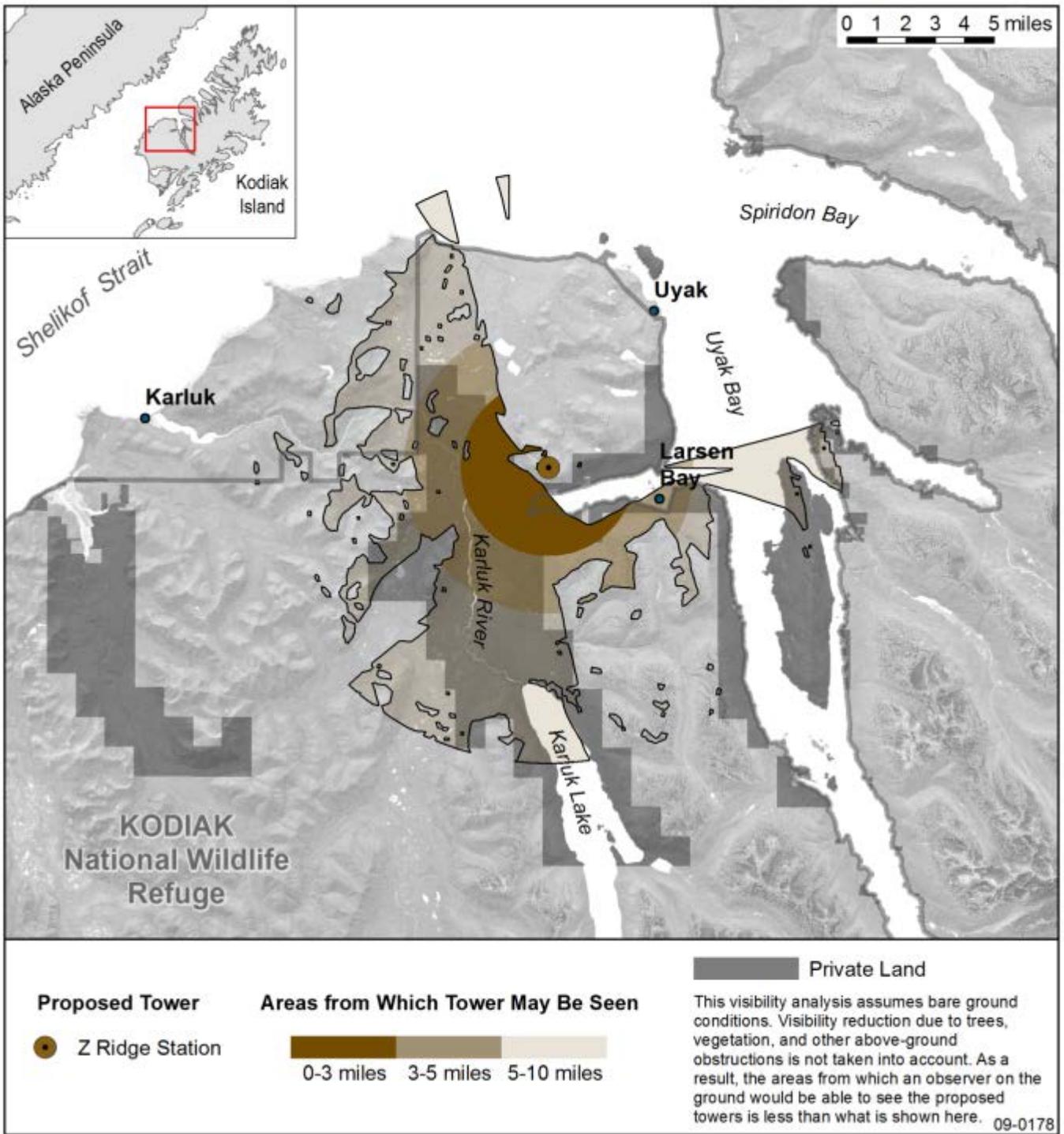


Figure 3-18. Locations where Z-Ridge Tower is Visible (Alternative 3)



## 4 Environmental Consequences

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NEPA requires the disclosure of environmental impacts associated with the alternatives including the No Action Alternative. This section presents the environmental impacts of Alternative 1 (No Action Alternative), Alternative 2 (Inner Route) and Alternative 3 (Outer Route). These analyses provide the basis for comparing the effects of the alternatives on the Affected Environment. NEPA requires consideration of context, intensity, and duration of direct impacts, indirect impacts, cumulative impacts, and measures to mitigate for impacts.

The direct, indirect, and cumulative impacts are described for each issue (impact topic) and where applicable, by project phase (construction and operation). The impacts for each issue are based on the intensity (magnitude), duration, and context (extent) of the impact. Summary impact levels (negligible, minor, moderate, or major) are given for each issue. Definitions are provided below. After sections defining terms and significance criteria and describing other foreseeable future actions (Section 4.1, 4.2, and 4.3, respectively), the analysis of the resources affected is divided into two sections.

Section 4.5 describes those resources with *common* effects between the action alternatives. The resources listed in this section are:

- Physical Environment – Soils;
- Physical Environment – Hazardous Materials
- Biological Environment – Vegetation;
- Biological Environment – Brown Bears;
- Social Environment – Cultural Resources
- Social Environment – Socioeconomic;
- Social Environment – Environmental Justice;
- Social Environment – Subsistence;
- Social Environment – Land Use; and,
- Social Environment – Noise.

Section 4.6 describes those resources with *unique* effects between the action alternatives. The resources listed in this section are:

- Biological Environment – Nesting Habitat for Surfbirds, Marbled Murrelets and Seabirds;
- Biological Environment – Marine Mammals
- Social Environment – Recreation;
- Social Environment – Lands with Wilderness Values; and,
- Social Environment – Visual.

### 4.1 Definitions of Terms

**Direct Effects** – Direct effects are impacts that are caused by the alternatives at the same time and in the same place as the action.

**Indirect Effects** – Indirect effects are impacts caused by the alternatives that occur later in time or farther in distance than the action.

**Cumulative effects** - CEQ defines cumulative effects as impacts on the environment which result from the incremental impact of an action when added to other past, present, and reasonably foreseeable future actions regardless of what agency (federal or non-federal) or person undertakes such other actions. Cumulative effects can result from individually minor, but collectively significant actions taking place over a period of time (CFR, Title 40, Section 1508.7). Informed decision making is served by consideration of cumulative effects resulting from projects that are proposed, under construction, recently completed, or anticipated to be implemented in the reasonably foreseeable future.

CEQ guidance in considering cumulative effects states that the first steps in assessing cumulative effects involve defining the scope of the other actions and their interrelationship with a proposed action. The scope must consider other projects whose effects coincide with the location and timetable of a proposed action and other actions. Cumulative effects analyses must also evaluate the nature of interactions among these actions (CEQ 1997). The cumulative effects assessment is based on available information at the time of development of this EA.

To identify cumulative effects, the analysis needs to address two fundamental questions.

1. Does a relationship exist such that affected resource areas of the Proposed Action or alternatives might interact with the affected resource areas of past, present, or reasonably foreseeable actions?
2. If such a relationship exists, then does an EA reveal any potentially significant effects not identified when the Proposed Action is considered alone?

**Mitigation** - Mitigation includes special procedures and minimization measures that are implemented to avoid, reduce, or compensate for effects caused by an action. Some mitigation measures are already incorporated into the Proposed Action to avoid and reduce the potential for adverse effects. Other mitigation measures could be characterized as Best Management Practices that further reduce or compensate for adverse effects.

## 4.2 Significance Criteria

Summaries of the effects on the resources synthesize information about context, intensity, and duration, which are weighed against each other to produce a final assessment. While each summary reflects a determination using best professional judgment regarding the relative importance of the various factors involved, Table 4-1 provides a general guide for how summaries are reached.

Table 4-1. Description of Final Assessment Categories

<b>Assessment</b>	<b>Description</b>
Beneficial	Resource improvements would occur and would have a perceptible change to the resource.
Adverse: Negligible	Impacts are generally extremely low in intensity (often they cannot be measured or observed), are temporary, and do not affect unique resources.
Adverse: Minor	Impacts tend to be low intensity or of short duration, although

	common resources may have more intense, longer-term impacts.
Adverse: Moderate	Impacts can be of any intensity or duration, although common resources are affected by higher intensity, longer impacts while unique resources are affected by medium or low intensity, shorter-duration impacts.
Adverse: Significant	Impacts that in their context and due to their intensity (severity) have the potential to meet the thresholds for significance set forth in CEQ regulations and therefore, warrant heightened attention and examination for potential mitigation in order to fulfill the policies set forth in NEPA.

### 4.3 Past, Present, or Reasonably Foreseeable Actions

The following projects have the potential to result in cumulative effects.

#### Current Coast Guard Communication Towers at Middle Cape and Twin Peak

In summer 2014, the Coast Guard constructed a communications facility at Middle Camp in the southwest corner of the Refuge. It is located at N 57°22'22.28" W 154°37'35.22". A second Coast Guard communication tower was constructed at Twin Peaks south of Ahkiok on Koniag Corporation land. For each of these towers, routine maintenance and fueling occurs annually via helicopter before May 15 or after August 15 in order to avoid the Kittlitz's murrelet nesting season.

#### Existing Tower Network between Port Lions and Mill Bay.

There is currently an existing microwave tower network with four towers to the northeast of the Alternatives 2 and 3 tower locations. The towers are located at Point Lions, Mount Herman and Mill Bay. These towers are maintained twice each year via helicopter and refueled once every 18 months, similar to what is proposed for the tower sites in this project.

#### Proposed Microwave Action Stations at Pillar Mountain, Elbow Mountain, Larsen Bay, Karluk Bay, and Karluk Passive.

Proposed microwave action stations at Pillar and Elbow Mountains would complete the network between Kodiak and Midridge, or Kodiak and Uganik Station. Larsen Bay, Karluk Bay, and Karluk Passive would bring the broadband signal to the communities of Karluk and Larsen Bay. These towers are all located on private lands. The development and maintenance of these sites would be similar to those proposed in Alternatives 2 and 3.

#### Removal of Existing Repeaters.

Small radio repeaters owned by the FWS are currently located on the Spiridon and Z Ridge sites, and are scheduled for removal in the summer of 2016

### 4.4 No Action – Alternative 1

Direct and Indirect Effects: Implementation of the No Action Alternative would result in no direct or indirect impacts to any of the considered resources. There would be no installations; and therefore no effects due to this project would occur.

Cumulative Effects: No direct or indirect effects to the existing condition of the resources considered would occur under the No Action Alternative; therefore, no cumulative effects would occur on the resources.

## **4.5 Resources with *Common* Effects Between the Inner Route (Alternative 2) & Outer Route (Alternative 3)**

For the resources included in this section, the only difference between the alternatives is the magnitude of the action. In Alternative 2, two tower sites would be developed and in Alternative 3, three tower sites would be developed. A description of the magnitude of the differences between the alternatives is detailed in Tables 2-3 and 2-4.

### **4.5.1 Physical Environment – Soils**

Minimization of soil erosion is considered when evaluating potential impacts of a proposed action on soil resources. Effects on soils would be adverse if they would alter the soil composition, structure, or function within the environment.

**Direct and Indirect Effects:** Negligible, direct, long-term, adverse impacts to soils would be expected as a result of minor grading within the construction footprint to level the tower sites. An approximate 40 ft radius area around the center of the 8 ft by 12 ft communication tower would encompass the tower site, 500 gallon propane tanks and other permanent structures would be placed at sites along the selected route. Minor grading might be necessary to level small areas for the placement of the permanent structures. The remaining modifications to the site would be associated with site development, would be temporary in nature and would not be expected to affect the natural character of soils on the site. Diesel and gasoline being used during construction would be stored in a containment pond to keep fuels from contaminating soils.

No impacts to soils at the construction staging areas at Larsen Bay or the Village Island site would be expected. The areas would be used to store equipment and supplies prior to transport to the microwave tower sites. Disturbance of the existing geology or soils would not be expected to be necessary to accommodate the storage of construction equipment and supplies.

**Cumulative Effects:** Negligible, direct, long-term cumulative effects to soils would be expected in association with the existing antenna sites at Point Lions, Mount Herman, and Mill Bay or the proposed Microwave Action Stations at Pillar Mountain, Elbow Mountain, Larsen Bay, Karluk Bay, and Karluk Passive. Past impacts to soils associated with the existing tower sites would be expected to have been negligible due to the small footprints of the structures. When combined with effects to soils associated with either alternative's antenna sites, the impacts would be expected to be negligible. Impacts to soils associated with development of proposed microwave action stations at Pillar and Elbow Mountains would also be expected to be negligible due to the limited area of land disturbance associated with development of the action stations. When combined with effects to soils associated with the either alternative's antenna sites, the impacts would be expected to be negligible.

Removal of existing repeaters at Z Ridge, Spiridon and other locations in the area would not be expected to impact soils, so no cumulative effects to soils would be expected.

**Mitigation:** Mitigation for impacts to soils would include placement of erosion and sedimentation controls as needed during construction and stabilization of disturbed areas during and immediately following construction will be required. Equipment use will be limited to the construction boundary shown on the site plans.

#### **4.5.2 Physical Environment – Hazardous Materials**

The level of impact to the environment is based on the likelihood that a spill is to take place and the amount of fuels and other contaminants available for spilling. The area of analysis is the immediate area of construction, the flight lines between the staging areas and the construction sites.

**Direct and Indirect Effects:** During construction negligible to moderate long-term effects could happen during this phase of the project. Through the limitation of fuel at the construction site and the use of a containment pond the likelihood of a large fuel spill at the tower site is unlikely. It is also possible that fuel being sling-loaded between the staging area and the construction area could be dropped causing direct long-term effects to the areas contaminated, but this is unlikely if industry standard construction and aviation protocols are followed. During the operation and maintenance of the project, propane (LPG) fuel will be used. Propane is environmentally safer for the soils and vegetation because the fuel leaks as a gas and not as a liquid. Given the amount of wind at each site, a propane leak would be dissipated quickly and although fuel would be lost, the effects to the environment from the fuel itself would be minimal.

**Cumulative:** Each of the staging areas (Village Islands and Larsen Bay) is located in heavily used location where the chance of the soils already being contaminated by fuel from the commercial fishing fleet and other equipment and heating fuel is much higher. It is expected that fuels for this project will also be contained at the staging area(s) in order to decrease the likelihood of spills and contamination to those areas. The addition of this project to the area poses only a minor increase in the amount of fuel in the staging areas and a moderate change to the possibility that the areas immediately affected by the construction of the towers may become contaminated.

**Mitigation:** Fuel storage, cleanup and spill reporting will be conducted in accordance with the Service policies. Absorbent material in sufficient quantity to handle operation spills must be on hand at all times for use in the event of an oil or fuel spill. A Spill Prevention Control and Countermeasure Plan (SPCC) will be developed and on site as applicable. If a spill does occur, the Refuge Manager would be notified immediately. A bond would be required of the permittee in order to ensure funding is available for any necessary contaminant clean-up.

#### **4.5.3 Biological Environment – Vegetation**

The level of impact on vegetation is based on (1) the importance (i.e., legal, commercial, recreational, ecological, or scientific) of the resource, (2) the proportion of the resource that

would be affected relative to its occurrence in the region, (3) the sensitivity of the resource to the proposed activities, and (4) the duration of ecological ramifications. A habitat perspective is used to provide a framework for analysis of general classes of impacts. Impacts to vegetation could include removal of vegetation; loss of available habitat; the introduction of new nonnative, invasive species or increased dispersal of existing nonnative, invasive species; dispersal of existing nonnative, invasive species; or adverse impacts from pollutants that are released from construction operations.

**Direct and Indirect Effects:** Negligible to minor, direct and indirect, short- and long-term adverse effects to vegetation would be expected as a result of clearing vegetation to accommodate structures associated with sites located within either alternative. Vegetation would need to be removed within the 8 ft by 12 ft area for the communication equipment shelter and possibly in the area of the 500 gallon propane tanks at both sites. Approximately 0.33 acres of permanent disturbance would occur at each of the tower sites to accommodate structures. Trampling or crushing of vegetation could occur during construction resulting in damage to plants in proximity to the tower site or helicopter landing area. Some mortality of vegetation could occur as a result of damage during construction. Re-establishment of vegetation following construction would likely take a long time. Almost all subarctic plants are perennials with seedlings that grow very slowly. Most early growth is concentrated in the roots. Revegetation can take decades in the alpine, subarctic environment such as the ridgetops associated with the microwave antenna sites. However, impacts to vegetation at the sites and in the surrounding areas would be expected to be negligible to minor because the construction footprints are small and substantial changes to vegetation at the sites would not be expected, as long as invasive species are not introduced.

Impacts to vegetation at the Larsen Bay and Village Island staging areas would also be expected to be negligible. It is expected that very little vegetation would need to be cleared to accommodate the staging of construction equipment and supplies.

Adverse impacts to the vegetation communities at the microwave antenna sites could occur as a result of the introduction of invasive plant species. Introduction of invasive species could over time result in a change in the composition of the natural vegetative communities in proximity to the microwave antenna sites. Invasive plants could be introduced in the form of seeds transported on construction equipment or supplies, or on helicopters transporting supplies and equipment to and from the sites. Rocky soils, a short growing season, and windy conditions make growing conditions at the sites difficult for any species of plants. However, there is the potential for the introduction and establishment of invasive species at the sites if equipment and supplies are not inspected and properly cleaned prior to transport to the sites.

**Cumulative Effects:** Negligible to minor, direct, long-term cumulative effects to vegetation would be expected in association with the existing antenna sites at Point Lions, Mount Herman and Mill Bay, and the proposed Microwave Action Stations at Pillar Mountain, Elbow Mountain, Larsen Bay, Karluk Bay, and Karluk Passive. Past impacts to vegetation associated with the existing tower sites would be expected to have been negligible due the small footprints of the structures. When combined with potential effects to vegetation associated with the antenna sites, the impacts would be expected to be negligible to minor. Impacts to vegetation

associated with development of proposed microwave action stations at Pillar Mountain, Elbow Mountain, Larsen Bay, Karluk Bay, and Karluk Passive would also be expected to be negligible due to the limited area of land disturbance associated with development of the action stations. When combined with effects to vegetation associated with the tower sites, cumulative effects would be expected to be negligible to minor.

**Mitigation:** Mitigation of impacts to vegetation would include avoidance of impacts associated with trampling, crushing, or collision to the extent possible. Staging of construction equipment and supplies would also occur in locations devoid of vegetation where possible. Construction equipment, supplies and helicopters would be inspected and cleaned as necessary prior to transport to the microwave antenna sites to minimize potential for the introduction of invasive species to the sites. During the annual maintenance visit, the site would be inspected for the growth of invasive plants. If invasive plants are found at a site; the permittee, with guidance from the Refuge, would develop and implement a plan for eradication.

#### **4.5.4 Biological Environment - Brown Bears (*Ursus arctos middendorffi*)**

**Direct and Indirect Effects:** Minor, direct and indirect, long-term impacts to brown bears would be expected as a result of the operations on either action alternative. Kodiak brown bears are found throughout Kodiak Island, and therefore are expected to occur throughout the area affected by the project, including the staging and construction areas and in the flight path between these areas. As noted in Section 3.3.1, brown bears routinely transit through the sites for either action alternative. Den sites are also expected to occur near any of the tower sites proposed in the action alternatives. The tower sites proposed in Alternative 2 are 15-20 miles from Karluk Lake drainage, which hosts one of the densest populations of brown bears in the world, but brown bears can travel many miles even in the course of a single day. It is not known if the proximity to the Karluk Lake drainage leads to a denser number of brown bear dens near the tower sites at Larsen Peak and Midridge.

Helicopter overflights are planned to occur at an elevation of approximately 1,500 ft above ground level (AGL) or higher. Anderson et al. (2009) reviewed available technical literature and postulated a range of brown bear responses related to the proximity, timing, frequency, duration, intensity, and severity of helicopter disturbance. Single-pass transit of a helicopter operated >1,640 ft above ground level was expected to have insignificant impact. In contrast, adverse effects such as behavior alteration, energy loss, or productivity decrease, was expected from sustained and frequent helicopter flights operated below 1,640 (and presumably less than 0.62 miles distance from a bear).

Studies conducted from 1982 to 1988 in Southwest Kodiak and in the Terror Lake region on the denning characteristics of brown bears on Kodiak Island showed (with the exception of one male bear that emerged on March 8) that bears in the study areas began to emerge from their dens in late April and continued to emerge through the end of May (Van Daele et al. 1989). Brown bears may be disturbed and/or displaced by motorized activity operated in the vicinity (i.e., < 0.62 mile) of occupied den sites (Linnell et al. 2000, Smith and Van Daele 1990, Reynolds et al. 1986, Schoen et al. 1987, Harding and Nagy 1980). Reynolds et al. (1986) detected increased heart rates of dened bears concurrent with passage of fixed-wing aircraft

flying at 1,640 – 2,297 ft elevation above ground level and den sites. Schoen et al. (1987) and Smith and Van Daele (1990) documented movement of denning bears instrumented with motion sensors concurrent with passage of fixed-wing aircraft flying near occupied den sites. Harding and Nagy (1980) documented some displacement of brown bears from dens associated with industrial development activity. Smith and Van Daele (1989) studied effects of hydroelectric facility development on brown bear in the upper Terror River area of Kodiak Island. No cases of den abandonment were documented at 11 occupied dens situated near (< 4,920 ft) construction project features probably because of minimal overlap in denning and construction activity periods.

Brown bears may also be attracted to areas where human food or waste is stored. Regardless of the alternative, human waste and foods are not to be stored in or near the construction sites in order to not attract brown bears to the locations.

**Cumulative Effects:** Minor, direct, short- and long-term cumulative effects to brown bears would be expected in association with the existing antenna sites at Point Lions, Mount Herman and Mill Bay and the proposed Microwave Action Stations at Pillar Mountain, Elbow Mountain, Larsen Bay, Karluk Bay, and Karluk Passive. Brown bear hunting season would not overlap with the construction or maintenance season, so cumulative effects from public use disturbance is not anticipated. Construction season would also not overlap with brown bear denning season; therefore, cumulative effects to bears are not anticipated.

**Mitigation:** Mitigation of impacts to brown bears would include food, food waste, and human waste being secured during construction and removed on a weekly basis to minimize attraction of brown bears to the sites, limiting helicopter flights to 2,000 AGL as much as possible, and scheduling construction activities between July 1 and October 24 and maintenance and refueling between December 1 and February 28 or August 1 to October 24 so as to not disturb denning brown bears and bear hunters.

#### **4.5.5 Social Environment – Cultural Resources**

**Construction Sites:** There are no expected effects to historic properties within the areas being considered for towers.

**Staging Areas:** A site visit and plan are being developed in order to complete the cultural resources determination for the staging area.

**Mitigation:** In accordance with Archaeological Resources Protection Act (16 U.S.C. 470aa), the disturbance of archaeological or historical sites and the removal of artifacts from Federal land is prohibited. If such sites or artifacts are encountered, the Permittee will immediately cease all work upon Federal land and notify the Refuge Manager. In addition, the permittee would only be allowed to operate at the staging area in the location(s) designated by a qualified archaeologist.

#### **4.5.6 Social Environment – Socioeconomic**

Impacts to socioeconomic resources would be considered to be significant if an action resulted in a substantial change in the local or regional population; and housing, community general services, or social conditions from the demands of additional population/population shifts. Impacts would also be considered major if there were a substantial change in the local or regional economy, employment, or spending or earning patterns.

**Direct and Indirect Effects:** Minor to moderate, direct, long-term beneficial effects to socioeconomic resources in the service area for the proposed project, regardless of the route, would be expected. Construction and operation of the microwave tower sites would not be expected to result in a change in the regional population or an increase in demands associated with increased population or population shifts. The workforce needed to construct the microwave tower sites would be expected to be small and workers would likely leave the area following completion of construction. The workforce associated with maintenance of the sites would also be expected to be small and transient in nature.

Beneficial effects to socioeconomic conditions would be expected as a result of making broadband telecommunication services available to the communities of Larsen Bay and Karluk. At present, Larsen Bay and Karluk do not have access to broadband internet and use private satellite networks. Although satellite provides telecommunication services in these rural villages, it is often slower speed with frequent delays in connectivity and low reliability limits its usefulness. Broadband internet would provide access for Larsen Bay and Karluk to modern education tools, telemedicine, and economic opportunities. The improved internet connectivity and reliability would provide residents with opportunities to facilitate economic development, and would improve services for health care providers, schools, government, tribal entities, non-profit entities, and residential users.

**Cumulative Effects:** Minor, direct, long-term beneficial cumulative effects to regional socioeconomic conditions would be expected in association with the combined effects of development of the proposed project and the existing tower sites at Point Lions, Mount Herman and Mill Bay. Beneficial cumulative effects would occur on a larger regional basis as a result of improving availability of broadband internet over an expanded area.

**Mitigation:** Impacts to socioeconomic resources in the region would be expected to be beneficial so no mitigation would be necessary.

#### **4.5.7 Social Environment – Environmental Justice**

Impacts associated with environmental justice would be considered to be significant if an action resulted in disproportionately high and adverse human health and environmental impacts on minority or low-income populations.

**Direct and Indirect Impacts:** Long-term, direct, moderate beneficial impacts to minority or low-income populations would be expected as a result developing the microwave tower project, regardless of the route. Each alternative would provide reliable broadband service in Larsen Bay and Karluk by providing high-capacity, high-speed, low delay connectivity. Access to a

reliable broadband service would provide access to modern education tools, telemedicine, and economic opportunities. The improved Internet connectivity and reliability would provide residents with opportunities to facilitate economic development, and would improve services for health care providers, schools, government, tribal entities, non-profit entities and residential users.

**Cumulative Effects:** Moderate, direct, long-term beneficial cumulative effects to minority or low-income populations would be expected in association with the combined effects of development of either alternative and the existing antenna sites at Point Lions, Mount Herman and Mill Bay. Beneficial cumulative effects would occur on a larger regional basis as a result of improving availability of broadband internet over an expanded area. Development of the proposed Microwave Action Stations at Pillar Mountain, Elbow Mountain, Larsen Bay, Karluk Bay, and Karluk Passive would further expand the availability of broadband internet in the region.

**Mitigation:** No mitigation would be necessary under either alternative. Impacts associated with Environmental Justice would be expected to be beneficial.

#### **4.5.8 Social Environment – Subsistence**

The Alaska National Interest Lands Conservation Act (ANILCA) Section 810 requires an evaluation of the effects on subsistence uses for any action to withdraw, reserve, lease, or otherwise permit the use, occupancy, or disposition of public lands. A comprehensive ANILCA Section 810 analysis is included in Appendix H.

**Direct and Indirect Effects:** No impacts to subsistence uses would be expected under either alternative. Implementation of the project, regardless of the route, would not result in a reduction in the abundance or availability of subsistence resources, result in a restriction of access to subsistence harvest areas, or result in an increase in competition for subsistence resources.

**Cumulative Effects:** No cumulative effects to subsistence uses would occur under either alternative. No effects to subsistence resources would be expected under either alternative, so no cumulative effects would occur.

**Mitigation:** Although no impacts to subsistence resources would be expected under either alternative, helicopter-supported refueling would occur during the window from December 1 to February 28 or August 1 to October 24 to avoid the most intensive hunting and fishing seasons.

#### **4.5.9 Social Environment – Land Use**

Factors considered when determining whether an alternative would have a significant impact on land use were evaluated and distinguished by the degree to which the impact would result in:

- Displacement of or adverse effects to relatively large blocks of existing land uses; and
- Development that is inconsistent with adopted laws, regulations, or the long-term goals of approved land use plans or policies.

**Direct and Indirect Effects:** Land and mineral ownership would not change under either alternative, although either route would not be consistent with the Comprehensive Conservation Plan (CCP) guidance because the facilities would be constructed within a Minimal Management area. Under the CCP, lands within the Minimal Management category are to maintain the natural environment with very little evidence of human-caused change, and ground-disturbing activities are to be avoided whenever possible. With the exception of cabins, no permanent structures are generally allowed. In order to allow the proposed facilities on the Kodiak Refuge, the Kodiak CCP would need to be amended to change the management category from Minimal Management to Moderate Management for areas in the immediate vicinity of the microwave tower sites. The change to Moderate Management would allow impacts to the naturalness of the environment and show distinct evidence of human-caused change. These impacts would be evident not only within the footprint of the Moderate Management, but also within the 10 mile viewshed of the proposed project (Figures 3-9 and 3-18). Habitats would be disturbed and their ability to function through natural processes might be impaired.

Specifically, direct, minor adverse effects would include long-term displacement of 0.33 acres of recreational land within the Kodiak Refuge for each tower and associated equipment for the life of the project and significant helicopter traffic during the construction season, which although of short duration, would be of high intensity and during the height of fishing and tourism season.

Indirect adverse effects would include the need for significant helicopter flights each time the towers need refueling, which is estimated to be every 18 months. Refueling activities would require 20 round trips for each tower in a single day. Although there are already multiple flights in the area on any given day (see Section 3.3.7), this level of helicopter use would be noticeable and would diminish the feeling of naturalness and remoteness for any refuge visitor using the area within the flight path for any purpose on that day. In addition, each constructed tower would require two maintenance visits each year. These would require only single helicopter flights which would have negligible adverse effects given the number of other aircraft activities already in the area.

**Cumulative Effects:** Implementation of either action alternative would increase the total effect on regional land use (due to additional helicopter use) and the acreage of disturbance associated with communication systems within the Kodiak Refuge. Removal of existing repeaters in the region that are no longer in use would result in a small decrease in the overall cumulative effects to land use resulting from the development of the proposed microwave antenna sites under either alternative.

**Mitigation:** As a mitigation measure, helicopter-supported refueling would occur during the window from December 1 to February 28 or August 1 to October 24 to avoid the most intensive hunting, fishing, and recreational activity period.

#### **4.5.10 Social Environment – Noise/Soundscape**

**Direct and Indirect Effects:** Direct adverse impacts to ambient noise levels associated with the construction and operation of the microwave antenna sites would be expected to be minor to moderate in the short-term. There are two sources of noise that would be associated with each alternative: helicopter flights to and from the microwave antenna sites for construction and construction equipment during site setup. Direct adverse impacts to ambient noise levels in the long-term would be from the propane generators used to power the sites during normal operation (negligible unless within a few feet of the equipment) and helicopter flights used during refueling and maintenance (minor given the short duration of the use and described in Section 2.).

##### **Effects During Construction**

The helicopter flights for the Midridge, Larsen Peak, Uganik and Spiridon sites would originate from the Village Island construction staging area. Helicopter flights for the Z-Ridge site would originate from the Larsen Bay construction staging area. A Robinson R-66 helicopter would be used for crew transport and light freight. A Bell Huey 204 helicopter would be used for medium sized lifts and initial material supply transportation to the sites. The Bell Huey 204 helicopter is known for the low frequency rumble which is due to blade slap against the air, and it is predominantly heard when the helicopter is approaching. The expected perceived noise level for a Bell Huey 204 helicopter is approximately 88 decibels and the expected perceived noise level for a Robinson R-66 is 81 decibels (ICAO Annex 2006). Other relative perceived noise levels are listed in Table 3-4.

The loudest areas of helicopter noise would occur at the construction staging area/departure sites and at the microwave antenna sites, although the helicopters will also be heard while in route between the staging areas and the construction sites. Project construction at each site is expected to take approximately 14 days. The estimated numbers of helicopter trips for mobilization, demobilization and supply and personnel movements to each site are presented in Table 2-3. Approximately 50 trips (four to five round trips per day) using a Robinson R-66 helicopter would occur at each site for transport of personnel and smaller materials and 20 trips (one to two trips per day) to each site using a Bell Huey 204 to transport heavy equipment and larger materials. Helicopters would travel between the construction staging areas and the microwave antenna sites at an altitude of approximately 1,500 ft above ground level or higher.

Noise from construction of the microwave antenna sites would involve portable gasoline-powered equipment, voices, and a variety of sounds associated with the construction camp. On-site construction of the repeater sites would involve the use of a track drill or a small handheld drill which uses hydraulic power for rotation, a “Digger 50” excavator powered by a Honda GX 340 motor, and a 4-wheel drive 8 cubic ft powered wheel barrow (Power Barrow) powered by a Honda 12 GXV 160 engine. Each of these tools is expected to generate a moderate level of noise. The sound levels associated with construction would be higher than the existing ambient natural levels at each site; however these noises would be temporary.

Under Alternative 2, there would be direct impacts to the soundscape around the Village Island staging area, but under Alternative 3 Village Island and Larsen Bay would be affected. During

construction, the effects to ambient noise levels at the microwave antenna sites would be expected to be of high intensity, local and temporary in duration. The maximum noise levels at the microwave antenna sites or the construction staging sites would be around 90 dBs during an individual landing or departure, however the duration of the construction activities would be limited to a single short-term period, so the duration would be temporary. Effects to ambient noise levels associated with construction of the microwave antenna sites would be expected to be moderate, direct, short-term and adverse.

Noise impacts to wildlife are discussed in Sections 4.5.4 Brown Bears and 4.6.1 Surfbirds, Murrelets and Seabirds. Overall, impacts to wildlife associated with noise during construction of the microwave antenna sites would be expected to be moderate, direct and indirect, short-term and adverse.

Operational noise at the microwave antenna sites would be produced primarily from the propane generator used to recharge batteries. The generator would be the dominant noise source at each of the microwave antenna sites. Similar generators create noise levels on the side opposite the exhaust vent of 76 dBs at a distance of 10 ft and 55 dBs at a distance of 50 ft. At the side adjacent to the exhaust vent, noise levels are around 85 dBs at 10 ft and 57 dBs at 50 ft (USCG 2010). Generator noise at the microwave antenna sites would be expected to attenuate to near background levels of 30 to 35 dBs at a distance of 500 to 550 ft from the generator (USCG 2010), assuming that at least a 5 to 10 mph wind is generally blowing.

#### **Effects During Operation & Maintenance**

The proposed microwave antenna sites would be visited twice per year to perform operation checks and maintenance. A Bell Huey 204 or similar helicopter would be used. Refueling of the propane generators would require 20 R-66 helicopter round trips over a single day every 18 months for the life of the project (25 years). Although the maximum noise levels during operation, maintenance and refueling activities would be associated with landings and take offs from the microwave antenna sites, flights would be noticeable while in transit as well. The maximum noise levels would be the same as those discussed under construction activities. The individual maintenance and refueling events would be shorter in duration than the construction activities, but they would occur periodically over the operational life of the project. Overall, effects of noise associated with operation, maintenance and refueling would be expected to be minor, direct, short-term and adverse over the life of the project.

**Cumulative Effects:** Moderate, direct, short-term and minor, direct, long-term cumulative adverse effects from noise would be expected in association with tower construction and ongoing maintenance. For the construction of Midridge, Larsen Peak, Spiridon or Uganik tower, an expected 50 helicopter flights over a 2 week period are expected from Village Islands. Z-Ridge, Pillar Mountain, Elbow Mountain, Larsen Bay, Karluk Bay, and Karluk Passive are being proposed from Larsen Bay. Village Islands (West Point) currently has only 4 flights per each 2 week period during the summer, plus other recreational aircraft. For the life of the project (25 years), each site would have a total of 20 helicopter flights, of 1 day duration or shorter, for refueling.

Although the construction flights will not overlap with brown bear denning or recreational bear hunting, they will overlap with seabird nesting season and the summer recreational hiking, fishing, and sight-seeing season. Flights associated with the operation and maintenance of the project will occur later in the year to avoid as much of the denning, nesting, and recreational season as possible.

**Mitigation:** When possible a 1/2 mile no fly zone around seabird colonies should be in place from May 15 to Sept 15 and overflights should be at a minimum of 2000 AGL. The 2000' AGL is based on FAA Advisory Circular 91-36C, "Visual Flight Rules (VFR) Flight Near Noise-Sensitive Areas." Helicopter-supported refueling would occur during the window from December 1 to February 28 or August 1 to October 24 to avoid the most intensive hunting, fishing and recreational activity period.

## **4.6 Resources with *Unique* Effects Between the Inner Route (Alternative 2) & Outer Route (Alternative 3)**

For the resources included in this section, in addition to the difference in magnitude between the alternatives there are also differences in how the two routes would affect the resource. A summary of these differences is listed in Tables 2-3 and 2-4.

### **4.6.1 Biological Environment –Nesting Habitat for Surfbirds, Marbled Murrelets and Seabirds**

The level of impact on wildlife is based on (1) the importance (i.e., legal, commercial, recreational, ecological, or scientific) of the resource, (2) the proportion of the resource that would be affected relative to its occurrence in the region, (3) the sensitivity of the resource to the proposed activities, and (4) the duration of ecological ramifications. A habitat perspective is used to provide a framework for analysis of general classes of impacts (i.e., removal of available habitat, noise, human disturbance).

Ground disturbance and noise might directly or indirectly cause potential impacts on wildlife resources. Direct impacts from ground disturbance are evaluated by identifying the types and locations of potential ground-disturbing activities in correlation to important biological resources. Mortality of individuals, habitat removal, and damage or degradation of habitats might be impacts associated with ground-disturbing activities.

Noise associated with a proposed action might be of sufficient magnitude to result in the direct loss of individuals and reduce reproductive output within certain ecological settings. Noise may also result in animals moving to less suitable habitat to escape from disturbance and noise. Ultimately, extreme cases of such stresses could lead to population declines or local or regional extinction. To evaluate impacts, considerations were given to the number of individuals or critical species involved, amount of habitat affected, relationship of the area of effect to total available habitat within the region, type of stressors involved, and magnitude of the impacts.

Because of construction being done on high alpine ridges and the magnitude of helicopter use in and around Uganik Island, the following species and groups are of particular concern:

- Surfbirds (*Calidris virgate*);

- Marbled murrelets (*Brachyramphus marmoratus*); and,
- Seabirds nesting in around around Village Islands and the Uganik Peninsula..

#### **4.6.1.1 Surfbirds and Marbled Murrelets**

##### **Inner Route - Alternative 2**

**Direct and Indirect Impacts:** Minor, direct and minor indirect short-term and minor, direct long-term adverse effects are anticipated to surfbirds at the Larsen Peak site of the Inner Route. Surfbirds nest on high alpine ridges and were seen at the Larsen Peak site during a project planning site visit. Although by delaying construction until after July 1, successful nests may already be vacated, any re-nesting efforts will probably be abandoned due to the noise and activity at the site. In the long run, by restricting annual maintenance and refueling outside the surfbird nesting season this disturbance may be avoided, but the addition of towers may provide avian predators with a perch from which to hunt surfbird chicks in the area. Other nesting sites in the area may also be affected due to the noise and number of helicopter flights to and from Village Islands. In the long-term it is not anticipated that nearby nesting areas would be affected.

Neither Midridge nor Larsen Peak are suitable nesting sites for marbled murrelets.

**Cumulative Impacts:** Minor, direct long term adverse effects are anticipated to any site within this route that has Surfbird nesting habitat. It is not clear if Point Lions, Mount Herman, Mill Bay, Pillar Mountain, Elbow Mountain, Larsen Bay, Karluk Bay, and Karluk Passive have suitable nesting habitat for surfbirds. Once construction is completed by limiting maintenance and refueling outside the surfbird nesting season no additional cumulative impacts are anticipated.

**Mitigation:** Construction and maintenance activities should be scheduled for after July 1 to avoid surfbird nesting season.

##### **Outer Route - Alternative 3**

**Direct and Indirect Impacts:** Minor, direct and minor indirect short-term and minor, direct long-term adverse effects are anticipated to surfbirds and marbled murrelets at the Uganik site of the outer route. Surfbirds and marbled murrelets nest on high alpine ridges and although they have not been seen at Uganik, the habitat meets the characteristics needed for surfbird and marbled murrelet nesting. Although by delaying construction until after July 1, successful nests may already be vacated, any re-nesting efforts will probably be abandoned due to the noise and activity at the site. In the long run, by restricting annual maintenance and refueling outside the surfbird nesting season this disturbance may be avoided, but the addition of towers may provide avian predators with a perch from which to hunt surfbird and marbled murrelet chicks in the area. Other nesting sites in the area may also be affected due to the noise and number of helicopter flights to and from Village Islands. In the long-term it is not anticipated that nearby nesting areas would be affected.

**Cumulative Impacts:** Minor, direct long term adverse effects are anticipated to any site within this route that has surfbird and marbled murrelet nesting habitat. It is not clear if Point

Lions, Mount Herman, Mill Bay, Pillar Mountain or Elbow Mountain have suitable nesting habitat for surfbirds or marbled murrelets. Once construction is completed by limiting maintenance and refueling outside the nesting season no additional cumulative impacts are anticipated.

**Mitigation:** Construction and maintenance activities should be scheduled for after July 1 to avoid surfbird and marbled murrelet nesting season.

#### **4.6.1.2 Seabirds**

##### **Inner Route - Alternative 2**

**Direct and Indirect Impacts:** Negligible to minor, indirect short-term adverse effects are anticipated to seabirds at the colonies near Village Islands. Birds documented to occur or nest in the islands, based on the North Pacific Seabird database, include double-crested cormorant (*Phalacrocorax auritus*), red-faced cormorant (*Phalacrocorax urile*), pelagic cormorant (*Phalacrocorax pelagicus*), glaucous-winged gull (*Larus glaucescens*), black oystercatcher (*Haematopus bachmani*), Arctic tern (*Sterna paradisaea*), common murre (*Uria aalge*), horned puffin, tufted puffin (*Fratercula cirrhata*), and pigeon guillemot. In order to construct the towers at Midridge and Larsen Peak, an estimated 140 helicopter flights will be taking off and landing near this nesting area. It is unknown whether this amount of disturbance will cause these birds to flush repeatedly causing nutritional stress or will result in abandoned nests. The area around Village Islands is heavily used by commercial fishing boat traffic and as a result birds in the area may be accustomed to loud noises, but there have been no studies or analyses to determine this. By restricting annual maintenance and refueling flights to areas outside a ½ mile no fly zone from seabird colonies and keeping flights 2000 feet above ground level (AGL) when flights must be nearby no long term effects are anticipated. Flights will not need to bypass the colonies because Midridge and Larsen Peak to the east, while the main colony is to the west of Village Islands.

**Cumulative Impacts:** Negligible to minor, indirect short term adverse effects are anticipated to seabird colonies along the flight path between Village Islands and Midridge and Larsen Peak sites. The area around Village Islands is heavily used by commercial fishing boat traffic and as a result birds in the area may be accustomed to loud noises, but there have been no studies or analyses to determine this. There is no anticipated affect to seabirds from the development of Point Lions, Mount Herman, Mill Bay, Pillar Mountain or Elbow Mountain. Once construction is completed by limiting maintenance and refueling flights to outside a ½ mile no fly zone from seabird colonies and keeping flights 2000 feet above ground level (AGL) when flights must be nearby no cumulative impacts are anticipated.

**Mitigation:** When possible a 1/2 mile no fly zone around seabird colonies should be in place from May 15 to Sept 15 and overflights should be at a minimum of 2000 AGL. The 2000' AGL is based on FAA Advisory Circular 91-36C, "Visual Flight Rules (VFR) Flight Near Noise-Sensitive Areas."

### **Outer Route - Alternative 3**

**Direct and Indirect Impacts:** Minor to moderate, indirect short-term adverse effects are anticipated to seabirds at the colonies near Village Islands. Birds documented to occur or nest in the islands, based on North Pacific Seabird database, include double-crested cormorant (*Phalacrocorax auritus*), red-faced cormorant (*Phalacrocorax urile*), pelagic cormorant (*Phalacrocorax pelagicus*), glaucous-winged gull (*Larus glaucescens*), black oystercatcher (*Haematopus bachmani*), Arctic tern (*Sterna paradisaea*), common murre (*Uria aalge*), horned puffin, tufted puffin (*Fratercula cirrhata*), and pigeon guillemot. In order to construct the towers at Spiridon and Uganik an estimated 140 helicopter flights will be taking off, landing and passing by nesting area. It is unknown whether this amount of disturbance will cause these birds to flush repeatedly causing nutritional stress or will result in abandoned nests. By restricting annual maintenance and refueling flights to areas outside a ½ mile no fly zone from seabird colonies and keeping flights 2000 feet above ground level (AGL) when flights must be nearby no long term effects are anticipated.

There are no seabird colonies that will be affected during the flights between Larsen Bay and Z-Ridge.

**Cumulative Impacts:** Minor to moderate, indirect short term adverse effects are anticipated to seabird colonies along the flight path between Village Islands and Spiridon and Uganik, and no effects are anticipated to seabird colonies along the flight path from Larsen Bay to Z-Ridge. There is no anticipated affect to seabirds from the development of Point Lions, Mount Herman, Mill Bay, Pillar Mountain, Elbow Mountain, Larsen Bay, Karluk Bay, and Karluk Passive. Once construction is completed by limiting maintenance and refueling flights to outside a ½ mile no fly zone from seabird colonies and keeping flights 2000 feet above ground level (AGL) when flights must be nearby no cumulative impacts are anticipated.

**Mitigation:** When possible a 1/2 mile no fly zone around seabird colonies should be in place from May 15 to Sept 15 and overflights should be at a minimum of 2000 AGL. The 2000' AGL is based on FAA Advisory Circular 91-36C, "Visual Flight Rules (VFR) Flight Near Noise-Sensitive Areas."

#### **4.6.1.3 Marine Mammals (Steller's sea lions and sea otters)**

##### **Inner Route - Alternative 2**

**Direct and Indirect Impacts:** Negligible, indirect short-term adverse effects are anticipated to Steller's sea lions and northern sea otters feeding near the Village Islands due to the entry and exit of the barge being used for construction supply transport and the multiple helicopter flights to and from the staging area to the inland sites of Midridge and Larsen Peak.

**Cumulative Impacts:** Negligible, indirect short term adverse effects are anticipated. The area around Village Islands is heavily used by commercial fishing boat traffic, set net sites and a cannery and as a result sea lions and sea otters in the area may be accustomed to loud noises, but there have been no studies or analyses to determine this. There is no anticipated affect to seabirds from the development of Point Lions, Mount Herman, Mill Bay, Pillar Mountain or

Elbow Mountain. By limiting refueling barges and flights from an area 3 nautical miles (nm) from any sea lion haul-out, no cumulative impacts are anticipated.

**Mitigation:** Barge traffic will remain at least three nautical miles from any sea lion haul-out or rookery during transit to and from the staging and refueling areas and helicopter traffic during construction, maintenance and refueling will remain at least three nautical miles from sea lion haul-outs.

### **Outer Route - Alternative 3**

**Direct and Indirect Impacts:** Minor, indirect short-term adverse effects are anticipated to Steller's sea lion haul-outs at Noisy Islands and Bird Rocks due to multiple helicopter flights in coming and going from Uganik and Spiridon sites. Negligible, indirect short-term adverse effects are anticipated to northern sea otters and sea lions feeding near the Village Islands due to the entry and exit of the barge being used for construction supply transport and the multiple helicopter flights to and from the staging area to the coastal sites of Uganik and Spiridon sites.

**Cumulative Impacts:** Negligible to minor, indirect short term adverse effects are anticipated. The area around Village Islands is heavily used by commercial fishing boat traffic, set net sites and a cannery and as a result sea lions and sea otters in the area may be accustomed to loud noises, but there have been no studies or analyses to determine this. There is no anticipated affect to sea lion or sea otters from the development of Point Lions, Mount Herman, Mill Bay, Pillar Mountain or Elbow Mountain. By limiting refueling barges and flights from an area 3 nautical miles (nm) from any sea lion haul-out, no cumulative impacts are anticipated.

**Mitigation:** Barge traffic will remain at least three nautical miles from any sea lion haul-out or rookery during transit to and from the staging and refueling areas and helicopter traffic during construction, maintenance and refueling will remain at least three nautical miles from sea lion haul-outs.

## **4.6.2. Social Environment – Recreation**

### **Outer Route - Alternative 2**

**Direct and Indirect Impacts - Effects During Construction:** Moderate, direct, short-term and minor, direct, long-term effects to the public recreational uses of this area would be expected from this alternative. The construction season and therefore the helicopter traffic would not be allowed during the spring brown bear hunting season because of concerns for denning brown bears discussed in Section 4.5.3, but it would overlap with the busy fishing and bear viewing season which occurs throughout the summer. It would be expected that the level of helicopter traffic during the construction windows could move public use to other areas to avoid the disturbance. According to lodge websites, visitors to the commercial lodges in and around Larsen Bay and Karluk pay up to \$1000 per day per visitor. These visitors expect to be recreating in an area that is relatively pristine. The addition of 70 round trip helicopter flights during a two week construction window may be seen as a significant intrusion.

**Direct and Indirect Impacts - Effects During Operation & Maintenance:** Once the construction is completed, the towers would be visible from much of the area around the Uyak

Bay, Dog Ear Mountain and the drainages inland from South Arm of Uganik Bay. As described in Section 3.3.8, users to this area may be particularly sensitive to changes in the viewshed. It should be noted that the towers are 50 foot tall, unlighted, neutral-colored lattice towers, but the microwave dishes on them will be relatively large, which may make them more visible. When the Little River Lake Cabin is rebuilt, users will be able to see towers from the ridge lines around the cabin.

Helicopter flights to maintain and refuel the two sites would occur only during a few days each year. Although refuge user experience on those days would be adversely affected, it would be short duration and not near refuge public use cabins.

**Cumulative Impacts:** The existing antenna sites at Point Lions, Mount Herman and Mill Bay, the proposed Microwave Action Stations at Pillar Mountain and Elbow Mountain do not add to the effects of the proposed towers as these stations are not on the refuge or visible from this area. The construction of Alternative 2 would add considerable activity in the short-term around Larsen Bay, Karluk and Village Islands which would adversely affect the experience of a visitor who is expecting to visit a more pristine environment.

In the long term, construction and operation of Alternative 2 would increase the total effect on the acreage of disturbance associated with communication systems within the Kodiak Refuge but this would not change the impact to recreationists. Some recreation users place particular value on the undeveloped character of the landscape they observe. The impacts would be considered to be moderate, direct, long-term and adverse, but would be limited in geographic scope.

**Mitigation:** As a mitigation measure, helicopter-supported refueling would occur during the window from December 1 to February 28 or August 1 to October 24 to avoid the most intensive hunting, fishing and recreational activity period.

### **Outer Route - Alternative 3**

**Direct and Indirect Impacts - Effects During Construction:** Moderate, direct, short-term effects to the public recreational uses would be expected from this alternative. Although helicopter traffic would be limited to the seasons before and after the majority of big game hunters are using the area, the towers would still be visible from much of the area around the Spiridon Peninsula, and Uganik, Spiridon, and Uyak Bays. As described in Section 3.3.8, users to this area are particularly sensitive to changes in the viewshed. It should also be noted, that the towers are unlighted, neutral-colored lattice towers that are 50 feet tall and may occasionally be shrouded by cloud cover. The dishes on them will be relatively large, though, which may make them more visible. Individuals who use Uganik Island cabin may be affected the most, because the Uganik tower will be directly across Uganik Bay and easily visible. As a result, use at this cabin may decline.

**Cumulative Impacts:** The existing antenna sites at Point Lions, Mount Herman and Mill Bay, the proposed Microwave Action Stations at Pillar Mountain and Elbow Mountain do not add to the effects of the proposed towers as these stations are not on the refuge or visible from this area. The construction of Alternative 3 would add considerable activity in the short-term

around Larsen Bay, Karluk and Village Islands which would adversely affect the experience of a visitor who is expecting to visit a more pristine environment.

In the long term construction and operation of Alternative 3 would increase the total effect on the acreage of disturbance associated with communication systems within the Kodiak Refuge but this would not change the impact to recreationists. Some recreation users place particular value on the undeveloped character of the landscape they observe. The impacts would be considered to be moderate, direct, long-term and adverse, but would be limited in geographic scope.

**Mitigation:** As a mitigation measure, helicopter-supported refueling would occur during the window from December 1 to February 28 or August 1 to October 24 to avoid the most intensive hunting, fishing and recreational activity period.

#### **4.6.3 Social Environment – Lands with Wilderness Values**

##### **Inner Route - Alternative 2**

In this section, impacts on wilderness values, as identified in the Refuge's CCP (USFWS 2006) are assessed. The analysis includes an evaluation of the potential for the qualities that comprise wilderness values to be altered by each alternative. The significance of impacts to wilderness values is assessed by evaluating the degree of degradation of the wilderness quality rendering the area as no longer eligible for inclusion in the Wilderness Preservation System.

**Direct and Indirect Impacts:** The impacts are considered to be minor to moderate in intensity, diminishing quickly at distances from the sites, though these would be permanent effects, through the life of the project, and affecting resources that are local and common to the area. Under the Proposed Action, the two microwave antenna sites would be constructed in the Zachar-Uganik and Ayakulik-Uyak Wilderness Review Units. The two units consist of 769,000 acres of lands of which approximately 0.66 acres would be impacted during the long-term operation of the facility. The development of Alternative 2 would affect the wilderness values of the lands during construction, operations, and maintenance of the proposed tower sites.

Under Alternative 2 the construction impacts would be limited to one season, but would be considered high intensity with many helicopter flights to and from the sites, and mechanized equipment being used at each site. During the operations phase, effects would include noise disturbance from the tower sites' generators, visual disturbance from the installed telecommunication facilities, and noise disturbance associated with helicopter-supported refueling operations. Limiting helicopter supported refueling flights to avoid the period of intensive hunting, fishing, and recreational activity, will reduce effects to opportunities for solitude and primitive recreation.

The proposed action at the Larsen Peak and Midridge sites would affect possible wilderness designation, based on the following criteria::

- **Size:** The criterion related to the size of the wilderness area would not be significantly changed by the development of the communications sites. The area of potential wilderness designation would remain extensive.
- **Untrammeled:** The untrammeled quality of the eligible wilderness units would not be affected, as natural processes would not be manipulated.
- **Naturalness:** The naturalness of the area would be adversely affected by the introduction of built features to accommodate the communications facility. They would permanently change the appearance of the area of about 0.66 acre and temporarily change the character of the areas used for the construction camp and staging areas. Although the towers would not be lighted at night and therefore would not add a visible nighttime feature, the appearance of the facilities would be observable from elsewhere within the potential wilderness area. The tower sites would be on peaks with no trees so they could be observed for many miles. The tower and the equipment building would be generally distinguishable as manmade features. Fog and low clouds would sometimes limit visibility, but during Alaskan summers the daylight hours are long and the easterly side of the island is relatively sunny. In contrast because the peaks on which the facilities would be located are only one element of a number of vegetated ridges extending to the horizon and because the sites are not the most vivid elements, the change in the natural character of these very small areas would not change the character of naturalness enjoyed by many observers, but may affect the enjoyment of sensitive users of the area.
- **Solitude and Unconfined Recreation:** Opportunities for solitude or primitive and unconfined recreation would be affected very little by the facilities because these ridge-top areas immediately around the tower sites are not used as often by recreationists. The greatest intrusion into the solitude of the area would be the initial helicopter trips to construct the sites and the helicopter visits twice a year for maintenance and once every 1.5 years to refuel the propane tanks.

**Cumulative Impacts:** The existing tower sites at Point Lions, Mount Herman and Mill Bay, the proposed Microwave Action Stations at Pillar Mountain, Elbow Mountain, Larsen Bay, Karluk Bay, and Karluk Passive do not add to the effects of the proposed towers as these stations are not on the refuge or visible from this area, but the addition of these towers along with the communication tower at Middle Cape does add to the overall decline of the naturalness of the area. The construction of Alternative 2 would add considerable activity in the short-term around Larsen Bay and Village Islands which would adversely affect the experience of a visitor who is expecting to visit a wild area. Some recreation users place particular value on the undeveloped character of the landscape they observe. The impacts would be considered to be moderate, direct, long-term and adverse, but would be limited in geographic scope.

**Mitigation:** As a mitigation measure, helicopter-supported refueling operations would be limited to between December 1 and February 28 or August 1 and October 24, outside the main recreational season and the towers and associated buildings should be of neutral color in order to make them blend in to the environment as much as possible.

### **Outer Route - Alternative 3**

**Direct and Indirect Effects:** Implementation of Alternative 3 would result in minor, long-term indirect impacts to areas eligible to be designated as wilderness. There would be no installations on lands these lands, but the Uganik and Spiridon towers may be visible from ridge lines and upper slopes within the Zachar-Uganik and Ayakulik-Uyak Wilderness Review Units.

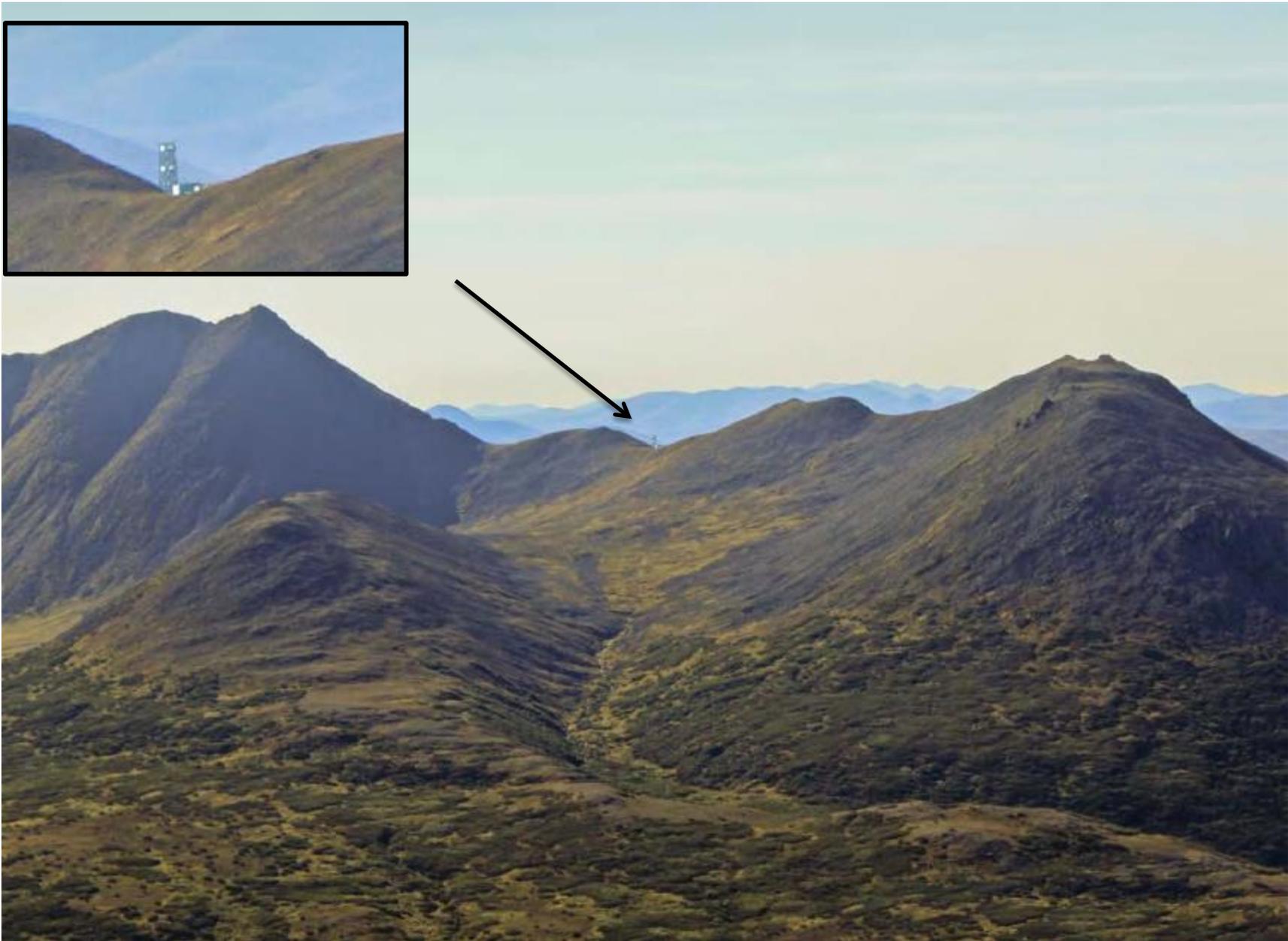
**Cumulative Effects:** The existing antenna sites at Point Lions, Mount Herman and Mill Bay, the proposed Microwave Action Stations at Pillar Mountain, Elbow Mountain, Larsen Bay, Karluk Bay, and Karluk Passive do not add to the effects of the proposed towers as these stations are not on the refuge or visible from this area. The construction of Alternative 3 would add considerable activity in the short-term around Larsen Bay, Karluk and Village Islands which would adversely affect the experience of a visitor who is expecting to visit a wild area. The impacts would be considered to be minor, direct, long-term and adverse, but would be limited in geographic scope.

**Mitigation:** As a mitigation measure, helicopter-supported refueling operations would be limited to between December 1 and February 28 or August 1 and October 24, outside the main recreational season and the towers and associated buildings should be of neutral color in order to make them blend in to the environment as much as possible.

#### **4.6.4 Social Environment – Visual**

The impact analysis was restricted to within 10 miles of the project area based on the assumption that the visual contrast between project features (i.e. towers and associated buildings) and the natural landscape declined beyond this distance (Figures 3-9 to 3-18). The three zones (0 to 3 miles or foreground, 3-5 miles or midground, and 5-10 miles or background) were delineated to give the reader a gauge for determining distance to known areas. Areas within 5 miles are most likely to have noticeable views of the towers, although within 10 miles towers may be noticeable by a sensitive viewer. Although a visual simulation of these this project was not done, the towers are similar to those analyzed in the TERRA Southwest Environmental Assessment prepared for FWS, National Park Service, and Bureau of Land Management in 2011. Figure 4-1 shows a 60 ft microwave tower from this 2011 project in a similar environment to this Kodiak project from 3.3 miles away.

Figure 4.1. Simulated view of Caribou Ridge Microwave Repeater TERRA Southwest Project from 3.3 miles away



## **Inner Route - Alternative 2**

**Direct and Indirect Effects - Construction:** Construction of the proposed microwave towers at Midridge and Larsen Peak would be expected to result in minor, temporary direct effects to visual resources. Direct effects would likely result from the intensity of the action at each project site, including increased activity on land and increase air traffic as a result of air transportation of materials and personnel. A change in perception by recreational visitors, air travelers, or people engaged in subsistence activities within sight of the construction activity may result from construction activities. Such viewer groups may select against areas with views of construction activities during this time. Construction-related activities is expected to be of high intensity, temporary in duration and local in geographic scope.

**Direct and Indirect Effects – Operations & Maintenance:** Because the towers and associated buildings make distinct vertical lines and smooth textures against a backdrop of sloping ridgelines and rough vegetation, the towers will be a noticeable change in the scenery over the long-term. Although generally this level of change is consistent with the visual resource management goals of the Kodiak Refuge, the proposed towers at Midridge and Larsen peak are within the Zachar-Uganik and Ayakulik-Uyak Wilderness Review Units where the Refuge tries to maintain the natural characteristic of the land as much as possible (FWS 2006).

The perceived change would be expected to be minimized by the scale of the landscape. In Uyak Bay, both the Larsen Peak tower and the Larsen Station tower would be visible. On peninsula between Uyak and Spiridon Bays, both Midridge and Larsen Peak would be visible at midground distances from some ridgelines, but at lower elevations both towers may be visible from a few locations. When traveling by air, it is unlikely that individual structures would be detectable at a distance greater than 10 miles, thereby reducing the chance air travelers would view two structures from proximate locations at the same time. Similar to the TERRA Southwest project, the speed of travel, angle of observation and scale of the landscape viewed from the air would further reduce the ability of air travelers to detect the sites from the air. Light reflection from the microwave dishes and towers could potentially increase contrast. However, mitigation measures including painting the tower and associated buildings with a non-reflective, matte, or light-absorbing finish would help the towers blend in to the surroundings.

It is possible that operation and maintenance of the proposed project may alter how sensitive viewers experience the affected landscape. Similarly, overland flights transporting recreational visitors to remote camps may also select against flight paths that would expose their clients to views of the microwave towers. Such impacts are considered a medium-intensity action, as a change in visual resources would be measurable, and could alter visitor experience. There are no other constructed facilities in the vicinity of either Midridge or Larsen Peak sites.

### **Cumulative Effects:**

Alternative 2 is expected to result in minor long-term impacts to visual resources in the immediate area and minor long-term impacts to the broader area. Midridge and Larsen Peak sites are located along one of the main flight paths from City of Kodiak to westside destinations and would be viewable for much of the time. Other noticeable features would include cabins, the hydrologic dam at Terror Lake, and the towers at Sheratin. Other towers being developed in

order to complete this network are several miles away and not within sight of these towers, except Larsen Station which is located just outside the community of Larsen Bay on private lands. Another communication tower site located on the refuge at Middle Cape is several miles away and not viewable from any of these locations.

**Mitigation:** The towers and associated buildings should be of neutral color in order to make them blend in to the environment as much as possible.

### **Outer Route - Alternative 3**

**Direct and Indirect Effects - Construction:** Construction of the proposed microwave towers at Uganik, Spiridon, and Z-Ridge would be expected to result in moderate temporary direct effects to visual resources, similar to the effects of Alternative 2. The additional flights to construct the third tower at Z-Ridge would be based out of Larsen Bay, instead of Village Islands. Direct effects would likely result from the intensity of the action at each project site, including increased activity on land and increase air traffic as a result of air transportation of materials and personnel. A change in perception by recreational visitors, air travelers, or people engaged in subsistence activities within sight of the construction activity may result from construction activities. Such viewer groups may select against areas with views of construction activities during this time. Construction-related action is expected to be of high intensity, temporary in duration and local in geographic scope.

**Direct and Indirect Effects – Operations & Maintenance:** Because the microwave towers and associated buildings make distinct vertical lines and smooth textures against a backdrop of sloping ridgelines and rough vegetation, the towers will be a noticeable change in the scenery over the long-term. Although generally this level of change is consistent with the visual resource management goals of the Kodiak Refuge, the proposed tower at Uganik would be visible and the tower at Spiridon may be visible from the Zachar-Uganik Wilderness Review Unit and Z-Ridge would be visible from the Ayakulik-Uyak Wilderness Review Unit where the Refuge tries to maintain the natural character of the land as much as possible (FWS 2006). The Z-Ridge tower would be viewable from the Karluk River, a popular fishing destination.

The perceived change would be expected to be minimized by the scale of the landscape. In Uyak Bay, Spiridon and Z-Ridge towers and the Larsen Station tower would be visible. On Spiridon Peninsula, both Spiridon and Uganik towers would be visible. From some locations on the peninsula only one or the other would be visible, and at lower elevations neither tower may be visible. Uganik tower would be visible from a few locations on Uganik Bay. When traveling by air, it is unlikely that individual structures would be detectable at a distance greater than 10 miles, thereby reducing the chance air travelers would view two structures from proximate locations at the same time. Similar to the TERRA Southwest project, the speed of travel, angle of observation and scale of the landscape viewed from the air would further reduce the ability of air travelers to detect the sites from the air. Light reflection from the microwave dishes and towers could potentially increase contrast. However, mitigation measures including painting the tower and associated buildings with a non-reflective, matte, or light-absorbing finish would help the towers blend in to the surroundings.

It is possible that operation and maintenance of the proposed project may alter the perception of the affected landscape by sensitive viewers. Similarly, overland flights transporting recreational visitors to remote camps may also select against flight paths that would expose their clients to views of the microwave towers. Such impacts are considered a medium-intensity action, as a change in visual resources would be measurable, and could alter visitor experience. It is also important to note that although the addition of towers may change the views, Uganik tower site is within 5 miles of Village Islands, an area with numerous homes, cabins, and a cannery and the Z-Ridge site is within sight of the community of Larsen Bay. There are no developments near the Spiridon tower site.

**Cumulative Effects:**

Alternative 3 is expected to result in moderate long-term impacts to visual resources in the immediate area, including Karluk River, and minor long-term impacts to the broader area. The tower sites in this alternative are nearer to areas already developed (i.e. Village Islands and Larsen Bay), and although they may be seen from areas where there has been no past actions that have altered the resources, they will be at such a distance as to make them only slightly noticeable (Figure 4-1). Other towers being developed in order to complete this network are several miles away and not within sight of these towers, except Larsen Bay Station which is located just outside the community of Larsen Bay on private lands. Another communication tower site located on the refuge at Middle Cape is several miles away and not viewable from any of these locations.

**Mitigation:** The towers and associated structures should be of neutral color in order to make them blend in to the environment as much as possible.

## **5 Statement of Environmental Significance of the Proposed Action**

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Based on the analysis of impacts on specific elements of the environment, no significant adverse impacts on the natural or human environment have been identified for the proposed communication facilities along the Inner Route Alternative through Midridge and Larsen Peak sites.

## **6 Irreversible and Irrecoverable Commitment of Resources**

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Irreversible or irretrievable commitments of resources would be made in construction materials used to build the facility and during operation through the use of propane for generating electricity. No other irreversible or irretrievable commitments have been identified as a result of the analysis of potential environmental impacts.

## **7 List of Preparers, Contributors, and Advisors**

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This EA was developed by two lead firms under separate contracts with Kodiak Microwave Systems, LLC (KMS) a subsidiary of Old Harbor Native Corporation. KMS contracted EA Engineering Science and Technology, Inc., PBC. (EA Engineering), and Solstice Alaska Consulting, Inc. to work with U.S. Fish and Wildlife Service (FWS) and additional subcontractors were brought in for specific tasks for the development of this EA. The FWS

holds final responsibility for all content. Personnel for each contributing party are listed in Table 6-1.

Table 6-1 Preparers, Contributors, and Advisors

<b>Contributing Party</b>	<b>Personnel</b>	<b>Title</b>
NMFS	Bridget Crokus	Wildlife Biologist – Protected Resources Division and Habitat Conservation Divisions
FWS	Tracy Fischbach	Natural Resources Planner, Region 7 Division of Realty & Conservation Planning
FWS	Lisa Willis	Realty Specialist, Region 7 Division of Realty & Conservation Planning
FWS	Scott McGee	Cartographer – Region 7 Division of Realty & Conservation Planning
FWS	Ed DeCleva	Regional Historic Preservation Officer– Region 7 Division of Visitor Services
FWS	Anne Marie LaRosa	Refuge Manager- Kodiak National Wildlife Refuge
FWS	Tevis Underwood	Deputy Refuge Manager- Kodiak National Wildlife Refuge
FWS	Bill Pyle	Supervisory Wildlife Biologist – Kodiak National Wildlife Refuge
FWS	Robin Corcoran	Wildlife Biologist (Avian) – Kodiak National Wildlife Refuge
FWS	Bill Leacock	Wildlife Biologist (Brown Bear)– Kodiak National Wildlife Refuge
FWS	Hans Klausner	Supervisory Park Ranger – Kodiak National Wildlife Refuge
FWS	Kevin Van Hatten	Pilot – Kodiak National Wildlife Refuge
FWS	Erin Knoll	Wildlife Biologist – Region 7 Endangered Species Program
FWS	Steve Lewis	Raptor Specialist- Region 7 Assessment and Monitoring
State of Alaska	Shina DuVall	State Historic Preservation Officer
KMS	Carl Gatter	Principal in Charge/Project Manager
KMS	Alex Smith	Project Manager
Cultural Resources Consultants, LLC	Michael Yarborough	Archaeologist
Cultural Resources Consultants, LLC	Aubrey Morrison	Archaeologist
Great Northern Engineering	Ric Martinez	GIS/ Project Figure Development
EA Engineering	Dan Savercool	Principal in Charge/Technical Reviewer
EA Engineering	Stephen Wrenn	Project Manager
EA Engineering	Jayne Aaron	Technical Writer
EA Engineering	Shannon Cauley	Technical Writer
EA Engineering	Jennifer Trainor	Technical Editor
EA Engineering	Evana Newberry	Writing Team Coordinator
Solstice Alaska Consulting, Inc.	Robin Reich	Principal in Charge/ Technical Writer
Solstice Alaska Consulting, Inc.	Olivia Cohn	Technical Writer

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## Appendix A. Public Notice

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### PUBLIC NOTICE

The Kodiak National Wildlife Refuge is in the process of gathering information for the proposal by Kodiak Microwave Systems, LLC (KMS) to construct a telecommunication project, (KMS4), on the southwest end of Kodiak Island within the Refuge. The project will provide broadband services to the communities of Larsen Bay and Karluk. This project will require installation of two microwave tower sites (approximately 120 feet by 120 feet), one on Mid-Ridge, approximately 17.3 miles northeast of the community of Larsen Bay and 33.7 miles northeast of Karluk, and one on Larsen Peak, approximately 8.2 miles northeast of the community of Larsen Bay and 24.7 miles northeast of Karluk. The towers would be 30 feet in height. If permitted, construction is anticipated to take place between May 1st 2016 and July 31st 2016. Access to the site for construction and annual maintenance would be by helicopter. If you have concerns or information relating to cultural, archaeological, or natural resources, public use, or any other items, please provide comments to Stephanie Brady ([stephanie\\_brady@fws.gov](mailto:stephanie_brady@fws.gov); 907.306.7448) by close of business July 6, 2015.

AMERICA'S NATIONAL WILDLIFE REFUGES...  
*where wildlife comes first!*



## Appendix B. Representative Scoping Letter to Native Tribes and Corporations

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United States Department of the Interior

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



IN REPLY REFER TO:  
NWR5715-

Mr. Tom Panamaroff, President  
Koniag Native Corporation  
194 Alimaq Drive  
Kodiak, AK 99615

Subject: Invitation to Engage in Government to Government Consultation about Proposed Microwave Towers on Kodiak National Wildlife Refuge

Dear Mr. Panamaroff:

The United States Fish and Wildlife Service (FWS) is considering an application from Kodiak Microwave System, LLC (KMS) to construct a telecommunication project on the southwest end of Kodiak Island within Kodiak National Wildlife Refuge. The project will provide broadband telecommunication services to the remote communities of Larsen Bay and Karluk.

We would like your thoughts and concerns about this project. They are important to us and they will affect how we move forward in considering this issue. In order to consider your input before we begin our analysis, we will need to consult with you before September 10, 2015; however, additional opportunities for consultation will also be available during a public comment period later this fall or early winter.

If you are interested in discussing this project with us or scheduling a formal consultation, please contact Anne Marie LaRosa by phone at (907) 487-2600; or by email at [annemarie\\_larosa@fws.gov](mailto:annemarie_larosa@fws.gov).

If you have questions regarding government to government consultation, please contact Crystal Leonetti, Alaska Native Affairs Specialist, at (907)786-3868 or [crystal\\_leonetti@fws.gov](mailto:crystal_leonetti@fws.gov).

Sincerely,

Anne Marie LaRosa  
Refuge Manager, Kodiak National Wildlife Refuge

# Appendix C. ESA Section 7 Intra-Agency Consultation

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ES Consultation Number: \_\_\_\_\_

Page 1 of 4



## Intra-Service Section 7 Biological Evaluation Form

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Originating Person: *Tracy Fischbach*  
Telephone Number: *(907) 786-3369*

Date Submitted: *September 3, 2015*  
Region 7 (Alaska)

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- I. **Service Program and Geographic Area or Station Name:** Division of Realty and Conservation Planning, Alaska Region, regarding a proposed right-of-way permit within the boundary of the Kodiak National Wildlife Refuge.
- II. **Flexible Funding Program** (e.g. Joint Venture, etc) if applicable: *n/a*
- III. **Species/Critical Habitat:** List federally-listed, proposed, and candidate species and designated or proposed critical habitat that occur or may occur within the action area: *See attached IPaC Trust Resource Reports entitled "KMS, T-348-KD, Larsen Peak" and "KMS, T-348-KD, Midridge."*
- IV. **Location:** The lands that the applicant has requested to use under the right-of-way permit application are located on Kodiak Island, Alaska, approximately 8 miles (Midridge) and 18 miles (Larsen Peak) northeasterly from the community of Larsen Bay. See attached map.
- V. **Project Description:** Kodiak Microwave System submitted an application to the Region 7 National Wildlife Refuge, Division of Realty and Conservation Planning requesting a right-of-way permit to construct two 50' free-standing, unlighted, lattice-type, microwave towers, one at an elevation of 2,835.65' and 2,503.99' on Larsen Peak and Midridge, respectively. The towers will initially support three 8'-10' microwave dishes plus a single communication hot with all electronics and generation equipment inside. There will also be up to six 500-gallon propane tanks on site. Each leased area will be an approximately 80' circle (5,024 square feet).

The project will be staged from private land in the Village Islands, an area with numerous homesteads, set net sites, a cannery and other commercial fishing activities. A barge will deliver equipment and materials to the staging site and then helicopters will be used to transport equipment, materials, and personnel to the construction sites. The barge is expected to travel at approximately 8 nautical miles per hour (nm/hr) and is required to stay at least 3 nm from sea-lion rookeries and haul-outs. Helicopter flight lines are recommended to stay above 2000 feet above ground level (AGL) and at least ½ mile away from seabird colonies and 3 nm from sea lion haul-outs and rookies. Construction is expected to begin in July and end in late August.

Twice yearly maintenance visits via helicopter for City of Kodiak are expected to each site. Refueling will occur from a barge located in either Uyak or Uganik Bay with multiple helicopter trips to replace propane tanks every 18 months. Maintenance and refueling trips are limited to September and early spring in order to avoid hunting and fishing seasons, and brown bear

cleaning.

The communication needs of two communities on Kodiak Island, Karluk and Larsen Bay, are now serviced by satellite earth stations. This service has very high reoccurring lease costs and bandwidth limitations that prohibit these communities from enjoying the benefits of modern communications offerings such as high speed internet, educational support services and tele-medicine services. The only practical way to provide the necessary communication connections for these villages is microwave radio.

## VI. Determination of Effects:

### (A) Description of Effects:

#### Staging Area:

The staging site for this project is located on the shore of Steller sea lion and northern sea otter critical habitat, in the Village Islands, also known as West Point, on the west side of Kodiak Island. Village Islands is a highly developed area of homesteads, set net sites, a cannery and other commercial activities. The closest known sea lion haul out from Village Islands is 10 miles away at Noisy Islands. Given the proximity of this site to the cannery in Village Islands, we assume that sea lions and sea otters frequent the area in search of food. All known sea lion haul-outs are along the outer coast of the island and are not within this sheltered bay.

Possible effects on sea lions and sea otters include disruption of their foraging activities by helicopter traffic coming and going from the staging area and from the barge entering and leaving the area. Due to concerns regarding the effects of the barge and helicopter traffic, we are requiring the barge to remain at least 3 nm from sea-lion rookeries and haul-outs. Helicopter flight lines are recommended to stay above 2000 feet above ground level (AGL) and at least ½ mile away from seabird colonies and 3 nm from sea lion haul-outs and rookies.

With these mitigation measures we anticipate that the project work at the staging area may affect, but is not likely to adversely affect, sea lions, sea otters or their critical habitat.

#### Construction Areas:

The Midridge construction site is on an elevation of 2,503 ft within the "neck" of the Spiridon Peninsula. Given the elevation and location, we have determined that activities at this location will have "no effect" on sea lions, sea otters or their critical habitat. The Larsen Peak construction site is approximately 8 miles from the Bird Rocks haul-out and located at an elevation of 2,835 ft and therefore we have determined that construction activities at this site will also have "no effect" on sea lions, sea otters or their critical habitat.

### (B) Other species of concern listed

Several migratory bird species are highlighted in the initial Information for Planning and Conservation (IPaC) report developed for this project. Although generally correct, the list also includes the fox sparrow, but in Western Alaska and Kodiak this species is not noted as a Bird of Conservation Concern (USFWS 2008). A "no effect" determination for these species is appropriate as they do not generally occur in the construction or staging areas. Additional information is included in the Environmental Assessment developed for this project.

**(B) Determination:** Determine the anticipated effects of the proposed project on species and critical habitats listed in item III. Check all applicable boxes and list the species associated with each determination.

	Response requested
<input type="checkbox"/> <i>"No effect"</i> This determination is appropriate when the proposed project will not directly or indirectly affect (neither negatively nor beneficially) a listed/proposed/candidate species or designated/proposed critical habitat of such species. List species applicable to this determination (or attach a list): _____	Concurrence  optional
<input checked="" type="checkbox"/> <i>"May affect but not likely to adversely affect species/critical habitat"</i> This determination is appropriate when the proposed project is not likely to adversely impact a listed species or designated critical habitat of such species. List species applicable to this determination (or attach a list): _____	Concurrence
<input type="checkbox"/> <i>"May affect and likely to adversely affect species/critical habitat"</i> This determination is appropriate when the proposed project is likely to adversely impact a listed species or designated critical habitat of such species. List species applicable to this determination (or attach a list): _____	_____ Formal Consultation
<input type="checkbox"/> <i>"Not likely to jeopardize candidate or proposed species/critical habitat"</i> This determination is appropriate when the proposed project is not expected to jeopardize the continued existence of a species proposed for listing or a candidate species, or adversely modify an area proposed for designation as critical habitat. List species applicable to this determination (or attach a list): _____	_____ Concurrence  Informal Conference optional
<input type="checkbox"/> <i>"Likely to jeopardize candidate or proposed species/critical habitat"</i> This determination is appropriate when the proposed project is reasonably expected to jeopardize the continued existence of a species proposed for listing or a candidate species, or adversely modify an area proposed for designation as critical habitat. List species applicable to this determination (or attach a list): _____	Formal Conference

ES Consultation Number: \_\_\_\_\_

Page 4 of 4

**Supervisor at originating station**

Printed Name:	<u>Douglas Campbell</u>
Signature:	<u><i>Douglas Campbell</i></u>
Date:	<u>4/25/2016</u>

**Reviewing Ecological Services Office Evaluation (check all that apply):**

- A. **Concurrence** \_\_\_\_\_  
**Non-concurrence** \_\_\_\_\_  
Explanation for non-concurrence:
- B. **Formal consultation required** \_\_\_\_\_  
List species or critical habitat unit:
- C. **Conference required** \_\_\_\_\_  
List species or critical habitat unit:

**Reviewing ES Office Supervisor**

Printed Name:	_____
Signature:	_____
Date:	_____

Name of Reviewing ES Office: \_\_\_\_\_

# Appendix D. ESA Section 7 Consultation Letter to National Marine Fisheries Service

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United States Department of the Interior

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



IN REPLY REFER TO:  
NWRS716-0036

APR 21 2016

**VIA EMAIL**

Greg Balogh  
NOAA Fisheries' National Marine Fisheries Service  
Protected Resources Division and Habitat Conservation Divisions  
222 West 7th Avenue, Box 43  
Anchorage, AK 99513

Re: Request for Consultation under Section 7 of the Endangered Species Act

Dear Mr. Balogh:

The U.S. Fish & Wildlife Service, National Wildlife Refuge System, Division of Realty and Conservation Planning proposes to permit the Kodiak Microwave Systems, LLC, to build and maintain two microwave towers on Kodiak National Wildlife Refuge. Enclosed is a Biological Evaluation to initiate informal consultation under Section 7(a)(2) of the Endangered Species Act (ESA).

As described in the enclosed BE the proposed action may affect, but is not likely to adversely affect, the following ESA-listed marine species: Steller's sea lion or its critical habitat. We request your concurrence with our 'not likely to adversely affect' determinations, and hereby request informal consultation under Section 7 of the ESA.

Please contact Tracy Fischbach at (907) 786-3369 or at [tracy.fischbach@fws.gov](mailto:tracy.fischbach@fws.gov) regarding this consultation request.

Respectfully,

Douglas Campbell  
Chief, Division of Realty and Conservation Planning  
National Wildlife Refuge System, Alaska

Enclosure: Biological Evaluation



## Biological Evaluation

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Originating Person: *Tracy Fischbach*  
Telephone Number: *(907) 786-3369*

Date Submitted: *April 18, 2016*  
Region 7 (Alaska)

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- I. **Service Program and Geographic Area or Station Name:** Division of Realty and Conservation Planning, Alaska Region, regarding a proposed right-of-way permit within the boundary of the Kodiak National Wildlife Refuge.
- II. **Flexible Funding Program** (e.g. Joint Venture, etc) if applicable: *n/a*
- III. **Species/Critical Habitat:** List federally-listed, proposed, and candidate species and designated or proposed critical habitat that occur or may occur within the action area: Steller's sea lion and its critical habitat.
- IV. **Location:** The lands that the applicant has requested to use under the right-of-way permit application are located on Kodiak Island, Alaska, approximately 8 miles (Midridge) and 18 miles (Larsen Peak) northeasterly from the community of Larsen Bay (Figure 1-1). Note that the staging area is shown on the south of Larsen Peak, but due to land ownership issues, the staging area has been move to Village Islands which is marked on the map with a red star. Known sea lion haul-out locations are marked with an orange triangle.
- V. **Project Description:** Kodiak Microwave System submitted an application to the Region 7 National Wildlife Refuge, Division of Realty and Conservation Planning requesting a right-of-way permit to construct two 50' free-standing, unlighted, lattice-type, microwave towers, one at an elevation of 2,835.65' and 2,503.98' on Larsen Peak and Midridge, respectively. The towers will initially support three 8'-10' microwave dishes plus a single communication hut with all electronics and generation equipment inside. There will also be up to six 500-gallon propane tanks on site. Each leased area will be an approximately 80' circle (5,024 square feet).

The project will be staged from private land in the Village Islands, an area with numerous homesteads, set net sites, a cannery and other commercial fishing activities. A barge will deliver equipment and materials from Anchorage, Alaska, or Seattle, Washington, to the staging site and then helicopters will be used to transport equipment, materials, and personnel to the construction sites. The barge is expected to travel at approximately 8 nautical miles per hour (nm/hr) and is required to stay at least

3 nm from sea-lion rookeries and haul-outs. Helicopter flight lines are recommended to stay above 2000 feet above ground level (AGL) and at least 3 nm from sea lion haul-outs and rookies. Construction is expected to begin in July and end in late August.

Twice yearly maintenance visits via helicopter for City of Kodiak are expected to each site. Refueling will occur from a barge located in either Uyak or Uganik Bay with multiple helicopter trips to replace propane tanks every 18 months. Maintenance and refueling trips are limited to September and early spring.

The communication needs of two communities on Kodiak Island, Karluk and Larsen Bay, are currently met with satellite earth stations. This service has very high reoccurring lease costs and bandwidth limitations that prohibit these communities from enjoying the benefits of modern communications offerings such as high speed internet, and education and tele-medicine services.

## **VI. Determination of Effects:**

### **(A) Description of Effects:**

#### **Staging Area:**

The staging site for this project is located on the shore of Steller's sea lion critical habitat, in the Village Islands, also known as West Point, on the west side of Kodiak Island. Village Islands is a developed area of homesteads, set net sites, a cannery and other commercial activities. The closest known sea lion haul-out from Village Islands is 10 miles away at Noisy Islands. Given the proximity of this site to the cannery in Village Islands, we assume that sea lions frequent the area in search of food. All known sea lion haul-outs and rookeries are along the outer coast of the island and are not within this sheltered bay.

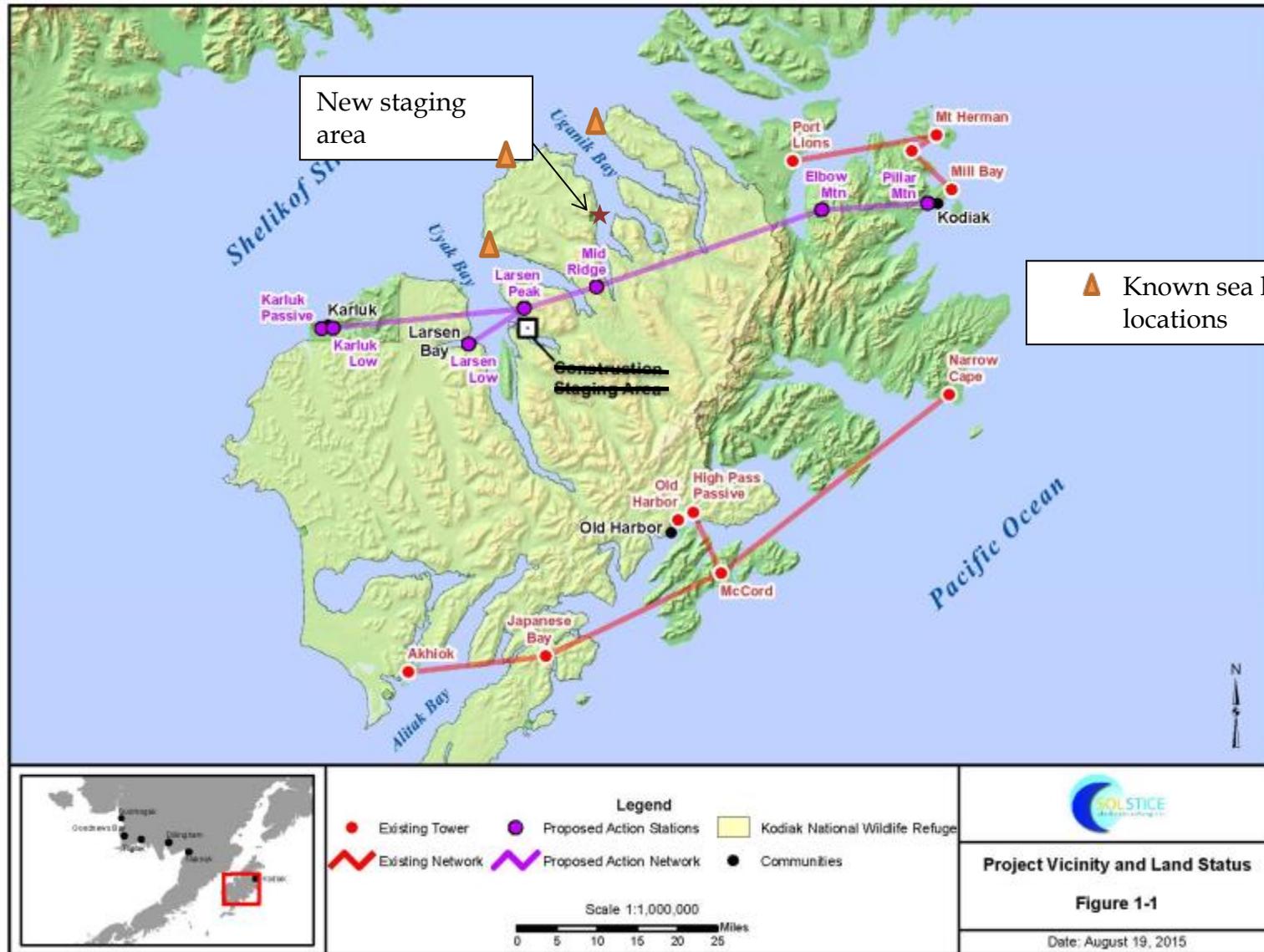
Possible effects on sea lions include disruption of their foraging activities by helicopter traffic coming and going from the staging area and from the barge entering and leaving the area. Due to concerns regarding the effects of the barge and helicopter traffic, we are requiring the barge to remain at least 3 nm from sea-lion rookeries and haul-outs. Helicopter flight lines are recommended to stay above 2000 feet above ground level (AGL) and at least 3 nm from sea lion haul-outs and rookies.

With these mitigation measures we anticipate that the project work at the staging area may affect, but is not likely to adversely affect, sea lions or their critical habitat.

#### **Construction Areas:**

The Midridge construction site is on at an elevation of 2,503 ft within the "neck" of the Spiridon Peninsula. Given the elevation and location, we have determined that activities at this location will have "no effect" on sea lions or their critical habitat. The Larsen Peak construction site is approximately 8 miles from the Bird Rocks haul-out and located at an elevation of 2,835 ft and therefore we have determined that construction activities at this site will also have "no effect" on sea lions or their critical habitat.

Figure 1-1. Selected Alternative and Existing Microwave Systems



## **Appendix E. DRAFT Compatibility Determination**

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**Use:** Rights-Of-Way for Remote Microwave Repeater Installation

**Refuge Name:** Kodiak National Wildlife Refuge

### **Establishing Authorities:**

Executive Order 8857 (1941) withdrew nearly two million acres from the unreserved public domain and established Kodiak National Wildlife Refuge. Public Land Order 1634 (1958) modified the original reservation, closing the one-mile shoreline strip to the land laws and other excepted purposes in exchange for classifying the Shearwater and Kupreanof peninsulas as unreserved public domain while retaining the original refuge purpose. As part of the Alaska Native Claims Settlement Act (1971), 345,600 acres of land within the Refuge were to be conveyed to to Native village corporations subject to Section 22(g) of ANCSA. Alaska National Interest Lands Conservation Act (ANILCA; 1980) redesignated the Kodiak National Wildlife Refuge with additional purposes (below) and added approximately 50,000 acres of public lands on Afognak and Ban islands to the Refuge.

### **Refuge Purposes:**

Executive Order 8857 established Kodiak National Wildlife Refuge “...for the purpose of protecting the natural feeding and breeding ranges of the brown bears and other wildlife on Uganik and Kodiak Islands . . .”. Lands that were part of the original refuge reservation retain this purpose along with the ANILCA purposes below. Section 303(5)(B) of ANILCA added the following purposes to the Refuge:

As ANILCA redesignated the Kodiak Refuge, all lands within the refuge, including the lands under ANILCA are managed for the following purposes:

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

### **National Wildlife Refuge System Mission:**

The mission of the National Wildlife Refuge System is to administer a national network of lands and waters for the conservation, management, and, where appropriate, restoration of the fish, wildlife, and plant resources and their habitats within the United States for the benefit of present and future generations of Americans (National Wildlife Refuge System Administration Act, as amended).

**Description of Use:** Kodiak Microwave System submitted an application to the Alaska Region National Wildlife Refuge's Division of Realty and Conservation Planning requesting a right-of-way permit to construct two 50' free-standing, unlighted, lattice-type, microwave towers, one at an elevation of 2,835.65' and 2,503.98' on Larsen Peak and Midridge, respectively. The towers will initially support three 8'-10' microwave dishes plus a single communication hut with all electronics and generation equipment inside. There will also be up to six 500-gallon propane tanks on site. Each leased area will be an approximately  $\frac{1}{3}$  acre in size.

The project will be staged from private land in the Village Islands. From there a barge will deliver equipment and materials to the staging site and helicopters will be used to transport equipment, materials, and personnel to the construction sites. Approximately 110 helicopter flights from Village Islands to each site will be required. Most of these flights will be with a Robinson R66 helicopter but numerous flights will require a larger Bell Huey 204. Construction is expected to begin in July and end in late August, 2016.

Twice yearly maintenance visits via helicopter from the City of Kodiak are expected to each site. Refueling will occur from a barge located in either Uyak or Uganik Bay with several helicopter trips to replace propane tanks every 18 months. Maintenance and refueling trips are limited to mid-winter and early fall.

**Availability of Resources:** Oversight of this right-of-way permit would require moderate effort prior to and during the construction period, a limited amount of staff time annually during the life of the project, and again, some additional effort during decommissioning at the end of the project life. Staff time during the construction year would focus on development of mitigation measures, execution of the right-of-way permit with appropriate bonding and other required documents, and field monitoring to assure compliance with provisions of the operations plan and permit. Annual monitoring would be minimal and focus on compliance with the operations plan and adherence to mitigation measures. It is expected that adequate resources are available for administration of this proposed right-of-way permit.

**Anticipated Impacts of the Use:** The Kodiak Refuge Comprehensive Conservation Plan (2006) designates the vast majority of the refuge as Minimal Management. This designation recognizes the natural character of the area and includes the area of the proposed tower sites. Impacts to the natural character of the area resulting from the tower installation and operation will occur in several ways. Installation, scheduled for 60 days during the summer of 2016, will require approximately 110 helicopter flights from Village Islands to each site. Noise from the helicopters will have a minor negative effect on sport and commercial users in the respective flight paths. Subsequent year operation of the sites will require maintenance and refueling flights two to three times each year. This combination of noise from operation and maintenance of the sites and the visual occurrence of the tower sites in this otherwise natural environment will have a minor negative impact on the naturalness of the Kodiak Refuge. This may negatively impact both wildlife and visitors to the refuge in the vicinity of the installations or the flight paths used to access the sites.

Wildlife most likely to be affected include surfbirds, marbled murrelets, and seabirds which nest in the vicinity of the tower sites and brown bear which den and forage in these areas. Because the barge and helicopter traffic will be required to remain at least 3 nautical miles away from rookery and haul-outs Steller’s sea lions should not be affected. Vegetation will be removed from 1/3 of an acre at each tower site.

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The installations on Larsen Bay and Midridge will have fixed visual and noise impacts over the life of the project. Mitigation will include painting of the facilities to reduce the contrast with surrounding terrain and timing of construction and maintenance of the facilities. Maintenance of the facilities -both annual and emergency - will take place exclusively with helicopter. Mitigation can be implemented that separates the scheduled maintenance activities from important wildlife occurrences and visitor use of the refuge. Unscheduled maintenance trips can be mitigated by conducting flights at the minimum 2000' AGL (weather permitting) until over the sites. The purposes of the Kodiak National Wildlife Refuge and the National Wildlife Refuge System mission are detailed above. The following table lists the anticipated impacts to selected environmental and social resources as detailed in the environmental assessment.

Affected Environment	Anticipated Impacts to Selected Resources
Soils	Negligible, direct, long-term adverse impacts would be expected. A total of 72 cubic ft. of soil would be permanently displaced over 2 sites and on each site approximately 0.33 acres would be disturbed.
Vegetation	Vegetation would be permanently affected on 0.66 acres; 1 of 2 sites is sparsely vegetated and rocky and 2.9 acres would be disturbed. With invasive species and prevention and mitigation measures properly implemented and without accidental fuel spills, impacts would be considered minor, affecting a relatively small area, for a long duration.
Hazardous Materials	Storage of fuels and hazardous materials onsite create risks of a release. However, containment designs and an approved SPCC plan reduce the risks. Given the limited fuel volume risks, the summary

	impact of a fuel spill would be considered minor.
Surfbird ( <i>Calidris virgate</i> )	Nesting habitat would be affected during construction in the short-term at Larsen Peak. There are no expected effects to surfbird nesting habitat on Midridge. In the long term, no effects are expected as refueling and maintenance will be limited to early spring and late summer, which is before and after the nesting season.
Marbled Murrelet ( <i>Brachyramphus marmoratus</i> )	No suitable nesting area along this route, therefore no change to current habitat is expected.
Seabird Colonies	Negligible to minor short term effects to nesting area from noise at Village Islands over the short term would be expected during Construction. No long-term effects are expected.
Brown Bears	Because construction is limited to after July 1 and refueling and maintenance is limited to winter and late summer, only minor, direct and indirect impacts to brown bears are anticipated. Impacts would be due to noise disturbance by helicopters traffic and construction activities.
Threatened & Endangered Species (Sea Lions and Sea Otters)	Short-term, moderate noise disturbance to feeding sea lions and sea otters at Village Islands is expected from helicopter take-off and landing from the Village Island staging area is expected over the short-term. No disturbance to haul-outs is expected.
Cultural Resources	No change to historic properties is expected at the construction sites. A final determination will be made regarding the Section 106 in the final EA.
Socioeconomic	Nominal beneficial economic effects are expected to the communities of Larsen Bay & Karluk from an improved internet connection.
Environmental Justice	No environmental justice concerns were identified.
Subsistence	Negligible effects to subsistence resources or opportunities are expected.
Land Use	Direct, minor adverse effects include the long-term displacement of 0.66 acres of recreational land within the Refuge. Two tower sites would be re-designated from Minimal Management to Moderate Management Areas.
Recreation	Recreational use would have minor, indirect effects in the short-term due to multiple helicopter flights on the Spiridon Peninsula and Larsen Peak areas and indirect, long-term effects due to a change to the visual resources in the Uyak Bay and interior valleys eastward from the Spiridon Peninsula.

Lands with Wilderness Values	Two towers would be constructed in lands eligible for wilderness designation affecting the undeveloped and natural values of the area and they would be visible for a few miles affecting the natural values of the broader landscape.
Noise/Soundscape	Noise from helicopter traffic would last for up to 2 months in and around the Spiridon and Uganik Bays and would occur for a short duration (1 day) 2-3 times per year for maintenance and refueling. The overall effects to the soundscape of the area would be considered minor to moderate in the short-term and minor in the long-term.
Visual Resources	Minor, short-term effects during construction would be expected due to numerous helicopter flights in the area. Minor, long-term effects are expected. Towers would be visible from much of Uyak Bay, the areas around Amook Island, interior valleys eastward from the Spiridon Peninsula, and the ridges around Little River Lake public use cabin, when it is rebuilt. But, although visible, the towers will not be as noticeable from areas 3 or more miles from the tower site. Towers would be easily visible from the air, possibly affecting flight seeing activities in the area.

**Preliminary Determination (check one below):**

Use is Not Compatible  
 Use is Compatible with the Following Stipulations

**Stipulations Necessary to Ensure Compatibility:**

1. Permittee will proactively protect vegetation and soil using a paneled mat system (Duradeck®, AlternaMATS®, GreatMats® or equivalent) where wheeled or tracked equipment is used and where levels of foot or other traffic risk damage to the vegetative mat, soil displacement, or exposure of soil.
2. Impacts associated with trampling or crushing of vegetation are to be avoided to the maximum extent possible. Staging of construction equipment and supplies will also occur in locations devoid of vegetation where possible. Construction equipment, supplies and helicopters would be inspected and cleaned as necessary prior to transport to the microwave antenna sites to minimize potential for the introduction of invasive species to the sites. During the annual maintenance visit, the site will be inspected for the growth of invasive plants. If invasive plants are found at a site; the permittee, with guidance from the Refuge, would develop and implement a plan for eradication.

3. A 1/2 mile no fly zone around seabird colonies will be in place from May 15 to Sept 15. If a flight is needed outside of these parameters, the permittee shall receive written approval from the authorizing official prior to flight.
4. Construction will occur between July 1 and October 24 and maintenance and refueling activities will occur between December 1 and February 28 or August 1 to October 24 so as to not disturb denning brown bears, nesting birds, recreationists, or subsistence users.
5. Barge traffic will remain at least three nautical miles from any sea lion haul-out or rookery during transit to and from the staging and refueling areas and helicopter traffic during construction, maintenance and refueling will remain at least three nautical miles from sea lion haul-outs.
6. While working in the staging area, the Permittee will only operate in the location(s) designated by a qualified archaeologist.
7. Towers and sheds will be tan in color or with a matte finish to help them blend into the environment as much as possible.

#### **ADDITIONAL GENERAL ROW STIPULATIONS**

8. The Refuge Manager or designee, upon request, shall be afforded the opportunity and logistical support from the nearest commercial transportation site to accompany the Permittee for the purpose of inspection and monitoring Permittee activities.
9. By accepting this permit, the Permittee agrees to reimburse the United States for costs incurred by the Service in monitoring the construction/installation, operation, maintenance, and removal of facilities within or next to the permit area. Cost reimbursement for these activities will be presented to the Permittee in annual cost Collection Agreements or activity specific cost collection agreements at the determination of the Refuge Manager.
10. This permit is subject to the express covenant that any facilities constructed thereon will be modified or adapted, if such is found by the Service to be necessary, without liability or expense to the United States, so that such facilities will not conflict with the use and occupancy of the land for any authorized works which may hereafter be constructed thereon under the authority of the United States. Any such modification will be planned and scheduled so as not to interfere unduly with the permitted project.
11. Grant of this permit is subject to the express condition that the exercise thereof will not unduly interfere with the management, administration, or disposal by the United States of the land affected thereby. The Permittee agrees and consents to the occupancy and use by the United States, its grantees, Permittees, or lessees, of any part of the permit area not actually occupied for the purpose of the granted rights to the extent that it does not interfere with the full and safe utilization thereof by the Permittee. The Permittee also agrees that authorized representatives of the United States will have the right of access to the permit area for making inspections and monitoring the construction, operation and maintenance of facilities.

### **Requirements for Construction**

12. Prior to beginning construction authorized under this permit, the Permittee shall submit to the Refuge Manager a Plan of Development describing all construction related activities anticipated to be carried out under the authority of this right-of-way permit. The plan must provide sufficiently detailed information to allow the Refuge Manager to effectively monitor activities to be carried out under the plan. Receipt and approval of the plan will be acknowledged in writing by the Refuge Manager. Proposed deviations from the Plan of Development must be submitted in writing to the Refuge Manager, and will only be allowed with the written acknowledgment of the Refuge Manager. At the end of each construction season Permittee shall provide a written report to the Refuge Manager for review and acceptance that documents work completed and work planned for the next season. Plans of development for any subsequent or additional construction must be submitted not later than 6 months from proposed construction for review and approval by the Refuge Manager.
13. Construction activities may only occur from July 1 to October 24.
14. Prior to commencing construction of the Facilities a preconstruction meeting including a representative of the Permittee, onsite project managers of all Permittee contractors or subcontractors and Service representatives shall be conducted on site.
15. The Permittee is responsible for obtaining all necessary State and Federal permits and submitting copies to the Refuge Manager prior to the start of construction.
16. Prior to commencing construction of the Facilities, the “construction boundary”, as shown on the site plans provided in the Plan of Development, shall be clearly marked in a manner that will survive and be evident throughout construction of the Facilities.
17. If construction is not commenced within one (1) year after permit issuance, the Service may cancel the permit.
18. Upon completion of construction, the Permittee will file two copies each of a Certification of Completion and as-built drawings and survey with the Chief, Division of Realty and Natural Resources, as proof of completion of construction.

### **Continuance of Operations**

19. Prior to September 30 of each year during the term of this Permit, a Plan of Annual Operations for annual maintenance, refueling operations, and other planned visits to the Facilities will be submitted to the Refuge Manager for approval. Included in the plan will be the following:
  - a. Refueling and annual maintenance of the Facilities will be conducted during the periods December 1 through February 28 or August 1 through October 24 to avoid denning bears, nesting season, and the main concentration of public use taking place on the refuge during the summer and fall and .

- b. The Refuge Manager will be notified no less than fourteen days prior to commencement of annual maintenance or refueling operations.
  - c. Flight routes to and from the Facilities which must avoid concentrated public use areas and sensitive wildlife areas to be identified by the refuge in advance
  - d. Subsequent plans must be submitted annually for approval and must be received by the Refuge office 30 days before the expiration of the current plan.
20. Permittee shall notify the Refuge Manager of any and all occurrences that require or necessitate emergency repairs/maintenance to the Facilities prior to commencement of activities if possible.
  21. No later than January 15 of each year during the term of this permit, the Permittee will provide a report to the Refuge Manager that details the previous year's activities at the Facilities. This report will include:
    - a. All helicopter flights to each site during the previous year including actual # of flights, dates of flights, aircraft used and actual flight paths.
    - b. The amount of fuel consumed at each site during the previous year (refuel to refuel).
  22. Any service interruptions during the previous year as a result any equipment failures or other causes at these Facilities, along with the cause and duration of those service interruptions.
  23. The Permittee is responsible for ensuring that all persons working for the Permittee and conducting activities including but not limited to contractors and subcontractors allowed by this permit have been given a copy of this Permit, have been briefed on the terms and conditions of this Permit and shall adhere to the conditions of this permit. A copy of this Permit will be kept on site at all times during construction and during major and scheduled maintenance of the Facilities.
  24. The Permittee's contractor(s) will develop and have on site a Spill Prevention Control and Countermeasure Plan, as applicable. A copy of this plan will be submitted to the Refuge Manager prior to commencement of construction. If a spill does occur, the Refuge Manager would be notified immediately. A bond would be required of the permittee in order to ensure funding is available for any necessary contaminant clean-up.
  25. All hazardous wastes (as defined by the Resource Conservation and Recovery Act of 1976, as amended) will be stored, transported, and disposed in accordance with regulation requirements.

**Conservation Measures**

26. The transportation and presence of any pets and other live animals of any kind to or on the Facilities are prohibited.

27. The Permittee's employees, contractors, subcontractors and any other individuals authorized to access the Facilities by the Permittee are prohibited from carrying or transporting firearms on and to the Refuge. Firearms to be used for safety purposes and only carried by a bear guard are permitted on the Facilities. A bear guard is defined as an employee of the Permittee or its contractors or subcontractors who has had 8 hours of bear awareness training.
28. The Permittee's employees, contractors, subcontractors and any other individuals authorized to access the Facilities by the Permittee are prohibited from hunting, fishing, and trapping while on the Refuge during construction, maintenance, refueling and emergency repair operations.
29. All helicopter flights to and from the sites will maintain a minimum altitude of 2000' AGL, weather permitting.
30. All food wastes will be stored in animal-proof containers and disposed on a weekly basis at a permitted off-Refuge facility.
31. All human waste will be removed from the site. All gray and black water or chemical toilet refuse generated at construction or production facilities will be transported off the Refuge to permitted treatment or disposal facilities.
32. Burning of trash, solid waste or any other substances or materials is prohibited. All trash and non-petroleum solid waste imported to or generated on the Facilities will be hauled off the Refuge and disposed in accordance with 18 AAC 60 (Solid Waste Regulations) and with 18 AAC 62 (Hazardous Waste Regulations).
33. ATV use shall not be permitted.
34. The Permittee shall be responsible for keeping the construction area clean. All trash, survey lath and other debris shall not be stored on site. All trash, survey lath and other debris shall be picked up daily and properly disposed of during the job. At the completion of construction, a final cleanup shall be conducted by the Permittee and approved by the Refuge Manager.
35. Permittee shall be responsible at all times during the life of this Permit for taking any and all actions to prevent introduction of invasive species on the Refuge. During each year for three years following construction and every five years thereafter, Permittee will be required to conduct a survey for invasive species at the Facilities and surrounding area. A report on this survey will be provided to the Refuge office no later than January 15 of each year following the survey.
36. Permittee will do everything reasonably within its power, both independently and on request of any duly authorized representative of the United States, to prevent and suppress fires on or near lands to be occupied under this permit, including making available such construction and maintenance forces as may be reasonably obtainable for the suppression of such fires.

37. Permittee must take such soil and resource conservation and protection measures on the land covered by the easement or permit as the Refuge Manager may request.
38. Any problems with wildlife must be reported immediately to the Refuge Manager. The Permittee, contractors, subcontractors and employees shall not feed animals. Wildlife shall not be harassed or intentionally approached closely enough to disrupt the animal's activity or to endanger human life. There shall be no taking of any animal except in the case of defense of life and property. In the case of a defense of life and property taking, the Permittee shall immediately contact the Alaska Department of Fish and Game and the Refuge Manager, and salvage those parts of the animal required by State regulations.
39. Permittee will comply with the Archaeological Resources Protection Act (16 U.S.C. 470aa). The disturbance of archaeological or historical sites and the removal of artifacts from Federal land is prohibited. If such sites or artifacts are encountered, the Permittee will immediately cease all work upon Federal land and notify the Refuge Manager.
40. The Permittee shall report any instances of dead birds found in the project area to the Refuge Manager or his/her representative in a timely manner.

**Justification:** In order to permit a new use, the U.S. Fish and Wildlife Service Compatibility Policy (603 FW 2) requires that the refuge manager determine that the use will not materially interfere with or detract from the fulfillment of the National Wildlife Refuge System mission or the purposes of the national wildlife refuge.

#### Compatibility with Service Mission

The proposed use does not materially interfere with or detract from the National Wildlife Refuge System Mission of administering lands and waters for the conservation, management, and restoration of fish, wildlife, and plant resources, and their habitats. Although there would be loss of 2/3 of an acre and impacts to wildlife would occur, it is expected that they would be minimal and that mitigation measures would further reduce anticipated impacts.

#### Compatibility with Refuge Purposes

The proposed use would not materially interfere with or detract from the Kodiak NWR's original purpose of protecting the natural feeding and breeding ranges of the brown bears and other wildlife on Uganik and Kodiak Islands. Affects to brown bears have been mitigated by requiring construction to begin after denning season. Maintenance and refueling would be required during the winter or late summer to avoid denning and foraging bears.

The proposed use would not materially interfere with or detract from the Kodiak NWR's primary purpose to conserve fish and wildlife populations and habitats in their natural diversity. Although there would be minor habitat fragmentation, and impacts to fish and wildlife populations from helicopter operations, it does not rise to the level of incompatibility.

The proposed use does not materially interfere with or detract from the Kodiak NWR's purpose to fulfill international treaty obligations of the United States with respect to fish and wildlife and

their habitats. The loss of migratory bird habitat from this project will be negligible. By locating the sites inland, their impact on coastal migratory birds will be minimized or eliminated. Because towers are no taller than 50' and no guy wires are used the mortality from bird strikes is expected to be minimized.

The proposed use does not materially interfere with or detract from the Kodiak NWR's purpose to provide the opportunity for continued subsistence uses by local residents. The draft EA evaluated the impact to subsistence and concluded that there are negligible effects to subsistence resources. The summary impact of this proposal on subsistence would be considered negligible.

The proposed use does not materially interfere with or detract from the Kodiak NWR's purpose to ensure water quality and necessary water quantity within the refuge. Neither of the sites is located near or adjacent to wetlands or waterways.

**Mandatory 10-year Re-evaluation Date:** N/A - Rights-of-Way often are approved for extended periods of time. The National Wildlife Refuge System Administration Act of 1966, as amended, treats Refuge uses that are approved for longer than 10 years differently than other uses. During the life of the permit, only compliance with the terms and conditions of the authorization is to be examined, not the authorization itself. After expiration of the permit, the use is to be re-evaluated for compatibility.

## **Appendix F. DRAFT Right-of-Way Stipulations**

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### **GENERAL TERMS AND CONDITIONS**

- Meanings of certain terms used herein:
- The term “Authorized Officer” means the applicable Refuge Manager of the National Wildlife Refuges in Alaska, or designated representative in charge of the land under administration by the U.S. Fish and Wildlife Service.
- The terms “Wildlife Resource” and Wildlife Resources” includes all fish, animals and birds and all vegetation including trees, plants, shrubs, grass, muskeg and marsh within, on, under or over the Permit area; and all lands, waters and all beds of waters within the Permit area and all appurtenances to lands and waters and beds of waters within the Permit area, whether natural or constructed.
- The Authorized Officer will monitor compliance with Permit terms, conditions and stipulations.

#### **1. TERM AND RENT:**

- a. The term for this permit is for \_\_\_\_ ( ) years or while it is used for the purpose granted, whichever period is shorter.
- b. The Permittee is required by applicable regulations and statute to make a rental payment in advance for use and occupancy of lands. The annual rental amount, as established by the U.S. Fish and Wildlife Service Annual Fee Schedule (Fee Schedule) as of the date of issuance is \_\_\_\_\_.
- c. Payment(s) by check must be payable to the U.S. Fish and Wildlife Service and forwarded to the attention of the Chief, Division of Realty and Conservation Planning, 1011 East Tudor Road, MS 211, Anchorage, Alaska 99503. Payment can also be made by credit card by contacting the Division of Realty and Conservation Planning R7 Collections Officer at (907) 786-3566 or 786-3541.
- d. Rental rates may be reviewed and adjusted by the Service at any time not less than five (5) years after the grant of the permit or the last revision of charges. Should the Fee Schedule be adjusted, then the rental rate would be adjusted accordingly. The Service will furnish a notice in writing to the Permittee of intent to impose new charges commencing with the ensuing charge year. The revised charges will be effective unless the Permittee files an appeal according to 50 C.F.R. 29.22.

#### **2. INSURANCE**

- a. Prior to commencement of a phase of activities, the Permittee shall provide to the Service, (attention Chief, Division of Realty and Conservation Planning, at the address above) the following:
- b. A binder or Certificate of Insurance demonstrating that the policy or policies are in place and effective, as required below.
- c. Permittee shall maintain in effect throughout the term of this Permit, one or more tiers of (a) environmental liability insurance or its equivalent, and (b) general liability insurance, each with a

combined single limit of \$\_\_\_\_\_ per occurrence. Such insurance shall specifically insure the Permittee against all environmental liability and commercial general liability, respectively, assumed by it under this Permit (subject to the customary terms and conditions of such policies), shall name the United States as an additional insured, shall contain a “no waiver of subrogation” provision and be adjusted for inflation not less than every three years using the Consumer Price Index, All Urban Consumers U.S. City Average (1982-1984 = 100) (“Consumer Price Index”) published by the Bureau of Labor Statistics of the United States Department of Labor.

3. This permit is granted subject to outstanding rights, if any, in third parties.
4. The Permittee, by accepting this permit, agrees to the terms and conditions contained herein.
5. By accepting this Permit, the Permittee agrees to reimburse the United States for certain costs incurred by the Service in processing the Permit application.
6. Permittee agrees to comply with State and Federal laws applicable to the project within which the easement or permit is granted, and to the lands which are included in the right-of-way, and lawful existing regulations thereunder.
7. Permittee agrees to clear and keep clear the lands within the easement or permit area to the extent and in the manner directed by the Authorized Officer; and to dispose of all vegetative and other material cut, uprooted, or otherwise accumulated during the construction, maintenance and restoration of the project in such a manner as to decrease the fire hazard and also in accordance with such instructions as the Authorized Officer may specify.
8. Permittee agrees to prevent the disturbance or removal of any public land survey monument or project boundary monument unless and until the applicant has requested and received from the Chief, Division of Realty and Conservation Planning approval of measures the applicant will take to perpetuate the location of aforesaid monument.
9. The Permittee shall comply with the provisions of the Archeological Resources Protection Act (16 U.S.C. 470(a) (a)). The disturbance of archeological or historical sites and the removal of artifacts from Federal land are prohibited. In the event that cultural resources are found during the project, a localized work halt shall be initiated. This will be followed immediately by telephone contact to the Refuge Manager, and concurrent contact with the State Historic Preservation Officer, to evaluate the significance of any findings and establish any protective measures that may be necessary.
10. Permittee agrees to take such soil and resource conservation and protection measures, including weed control on the land covered by the easement or permit as the Authorized Officer in charge may request.
11. Permittee agrees to do everything reasonably within his power, both independently and on request of any duly authorized representative of the United States, to prevent and suppress fires on or near, lands to be occupied under the easement or permit area, including making available such construction and maintenance forces as may be reasonably obtainable for the suppression of such fires.
12. Permittee agrees to rebuild and repair such roads, fences, structures, and trails as may be destroyed or injured by construction work and upon request by the Authorized Officer, to build and maintain necessary and suitable crossings for all roads and trails that intersect the works constructed, maintained, or operated under the right-of-way.

13. Permittee agrees to pay the United States the full value for all damages to the lands or other property of the United States caused by him or by his employees, contractors, or employees of the contractors, and to indemnify the United States against any liability for damages to life, person or property arising from the occupancy or use of the lands under the easement or permit, except where the easement or permit is granted hereunder to a State or other governmental agency which has no legal power to assume such a liability with respect to damages caused by it to lands or property, such agency in lieu thereof agrees to repair all such damages. Where the easement or permit involves lands which are under the exclusive jurisdiction of the United States, the holder or his employees, contractors, or agents of the contractors, shall be liable to third parties for injuries incurred in connection with the easement or permit area. Grants of easements or permits involving special hazards will impose liability without fault for injury and damage to the land and property of the United States up to a specified maximum limit commensurate with the foreseeable risks or hazards presented. The amount of no-fault liability for each occurrence is hereby limited to no more than \$\_\_\_\_\_.
14. Permittee agrees that all or any part of the easement or permit granted may be terminated by the Chief, Division of Realty and Conservation Planning, for failure to comply with any or all of the terms or conditions of the grant, or for abandonment. A rebuttable presumption of abandonment is raised by deliberate failure of the holder to use for any continuous 2-year period the easement or permit for the purpose for which it was granted or renewed. In the event of noncompliance or abandonment, the Chief, Division of Realty and Conservation Planning will notify in writing the holder of the easement or permit of his intention to suspend or terminate such grant 60 days from the date of the notice, stating the reasons therefor, unless prior to that time the holder completes such corrective actions as are specified in the notice. The Chief, Division of Realty and Conservation Planning may grant an extension of time within which to complete corrective actions when, in his judgment, extenuating circumstances not within the holder's control such as adverse weather conditions, disturbance to wildlife during breeding periods or periods of peak concentration, or other compelling reasons warrant. Failure to take corrective action within the 60-day period will result in a determination by the Chief, Division of Realty and Conservation Planning to suspend or terminate the easement or permit. No administrative proceeding shall be required where the easement or permit terminates under its terms.
15. Permittee agrees to restore the land to its original condition to the satisfaction of the Chief, Division of Realty and Conservation Planning so far as it is reasonably possible to do so upon revocation and/or termination of the easement or permit, unless this requirement is waived in writing by the Chief, Division of Realty and Conservation Planning. Termination also includes permits or easements that terminate under the terms of the grant.
16. Permittee agrees to keep the Chief, Division of Realty and Conservation Planning and the Authorized Officer informed at all times of his address, and, in case of corporations, of the address of its principal place of business and the names and addresses of its principal officers.
17. Permittee agrees that in the construction, operation, and maintenance of the project, he shall not discriminate against any employee or applicant for employment because of race, creed, color, or national origin and shall require an identical provision to be included in all subcontracts.
18. Permittee agrees that the grant of the easement or permit shall be subject to the express condition that the exercise thereof will not unduly interfere with the management, administration, or disposal by the United States of the land affected thereby. The applicant agrees and consents to

the occupancy and use by the United States, its grantees, permittees, or lessees of any part of the easement of permit area not actually occupied for the purpose of the granted rights to the extent that it does not interfere with the full and safe utilization thereof by the holder. The holder of an easement or permit also agrees that authorized representatives of the United States shall have the right of access to the easement or permit area for the purpose of making inspections and monitoring the construction, operation and maintenance of facilities.

19. Permittee understands and agrees that the easement or permit herein granted shall be subject to the express covenant that any facility constructed thereon will be modified or adapted, if such is found by the Chief, Division of Realty and Conservation Planning to be necessary, without liability or expense to the United States, so that such facility will not conflict with the use and occupancy of the land for any authorized works which may hereafter be constructed thereon under the authority of the United States. Any such modification will be planned and scheduled so as not to interfere unduly with or to have minimal effect upon continuity of energy and delivery requirements.
20. Permittee agrees that the easement or permit herein granted shall be for the specific use described and may not be construed to include the further right to authorize any other use within the easement or permit area unless approved in writing by the Chief, Division of Realty and Conservation Planning.
21. Permittee agrees that the Chief, Division of Realty and Conservation Planning reserves the right to grant additional rights-of-way or permits for compatible uses on or adjacent to rights-of-way or permit areas granted under this permit after giving notice to the Permittee and an opportunity to comment.

### **Construction**

22. Permittee agrees that if construction is not commenced within two (2) years after date of right-of-way grant, the right-of-way may be canceled by the Chief, Division of Realty and Conservation Planning at his/her discretion.
23. Proof of construction/installation: Permittee agrees that upon completion of construction, the Permittee shall provide verification of as-built coordinates with the Authorized Officer and the Chief, Division of Realty and Conservation Planning.
24. The Permittee is responsible for obtaining all necessary State, Federal and/or Borough permits prior to the start of construction.
25. If the Authorized Officer determines that an immediate temporary suspension of activities within a right-of-way or Permit area is necessary to protect public health and safety or the environment or for seasonal constraints and weather, he or she may issue an emergency suspension order to abate such activities without an administrative hearing.
26. The Service and Permittee jointly recognize and acknowledge that the site locations of the Project are undeveloped and undisturbed land free of any and all petroleum, metals and hazardous wastes. As such, soil tests for petroleum, non-naturally occurring metals and hazardous wastes prior to construction are not required to establish baseline values. Permittee is not relieved of any future responsibility or liability for the remediation, cleanup and or disposal of any petroleum, metal or hazardous waste contamination identified or discovered at any time during the life of this Permit.

27. The Permittee's employees, contractors, subcontractors and any other individuals authorized to access the Project by the Permittee are prohibited from utilizing the area for hunting, trapping and/or fishing except under the terms and conditions that apply to the general public for access for those activities

**Disposal, transfer or termination of interest.**

28. Change in jurisdiction over and disposal of lands. The final disposal by the United States of any tract of land traversed by a right-of-way shall not be construed to be a revocation of the right-of-way in whole or in part, but such final disposition shall be deemed and taken to be subject to such right-of-way unless it has been specifically canceled.
29. Transfer of easement or permit. Any proposed transfer, by assignment, lease, operating agreement or otherwise, of an easement or permit must be filed in triplicate with the Chief, Division of Realty and Conservation Planning and must be supported by a stipulation that the transferee agrees to comply with and be bound by the terms and conditions of the original grant. A \$25 nonreturnable service fee must accompany the proposal. No transfer will be recognized unless and until approved in writing by the Chief, Division of Realty and Conservation Planning.
30. Disposal of property on termination of right-of-way. In the absence of any agreement to the contrary, the holder of the right-of-way will be allowed 6 months after termination to remove all property or improvements other than a road and useable improvements to a road, placed thereon by him; otherwise, all such property and improvements shall become the property of the United States. Extensions of time may be granted at the discretion of the Chief, Division of Realty and Conservation Planning.
31. Fuel storage, cleanup, and spill reporting will be conducted in accordance with the Service, Region 7, and Fuel Storage Policy R7-4, attached hereto as Exhibit "\_\_\_\_". Sorbent material in sufficient quantity to handle operation spills must be on hand at all times for use in the event of an oil or fuel spill. The Permittee will develop and have on site a Spill Prevention Control and Countermeasure Plan (SPCC), as applicable. The SPCC plans of the Permittees, its contractor(s) and subcontractor(s) are hereby incorporated into the terms and conditions of this right-of-way Permit.
32. Consistent with 50 C.F.R. 25.21(h), the Authorized Officer may require Permit modifications at any future time to ensure compatibility with the use and occupancy of the land. Additional Permit conditions and stipulations may be added over the life of the Permit based on new information, technologies, or concerns.
33. The Service reserves the right to grant additional right-of-ways or permits for compatible uses on or adjacent to the right-of-way permit area in order to minimize adverse environmental impacts and the proliferation of separate rights-of way across Federal lands.

**PROJECT SPECIFIC TERMS AND CONDITIONS**

41. The Refuge Manager or designee, upon request, shall be afforded the opportunity and logistical support from the nearest commercial transportation site to accompany the Permittee for the purpose of inspection and monitoring Permittee activities.
42. By accepting this permit, the Permittee agrees to reimburse the United States for costs incurred

by the Service in monitoring the construction/installation, operation, maintenance, and removal of facilities within or next to the permit area. Cost reimbursement for these activities will be presented to the Permittee in annual cost Collection Agreements or activity specific cost collection agreements at the determination of the Refuge Manager.

43. This permit is subject to the express covenant that any facilities constructed thereon will be modified or adapted, if such is found by the Service to be necessary, without liability or expense to the United States, so that such facilities will not conflict with the use and occupancy of the land for any authorized works which may hereafter be constructed thereon under the authority of the United States. Any such modification will be planned and scheduled so as not to interfere unduly with the permitted project.
44. Grant of this permit is subject to the express condition that the exercise thereof will not unduly interfere with the management, administration, or disposal by the United States of the land affected thereby. The Permittee agrees and consents to the occupancy and use by the United States, its grantees, Permittees, or lessees, of any part of the permit area not actually occupied for the purpose of the granted rights to the extent that it does not interfere with the full and safe utilization thereof by the Permittee. The Permittee also agrees that authorized representatives of the United States will have the right of access to the permit area for making inspections and monitoring the construction, operation and maintenance of facilities.

#### **Requirements for Construction**

45. Prior to beginning construction authorized under this permit, the Permittee shall submit to the Refuge Manager a Plan of Development describing all construction related activities anticipated to be carried out under the authority of this right-of-way permit. The plan must provide sufficiently detailed information to allow the Refuge Manager to effectively monitor activities to be carried out under the plan. Receipt and approval of the plan will be acknowledged in writing by the Refuge Manager. Proposed deviations from the Plan of Development must be submitted in writing to the Refuge Manager, and will only be allowed with the written acknowledgment of the Refuge Manager. At the end of each construction season Permittee shall provide a written report to the Refuge Manager for review and acceptance that documents work completed and work planned for the next season. Plans of development for any subsequent or additional construction must be submitted not later than 6 months from proposed construction for review and approval by the Refuge Manager.
46. Construction activities may only occur from July 1 to October 24.
47. Prior to commencing construction of the Facilities a preconstruction meeting including a representative of the Permittee, onsite project managers of all Permittee contractors or subcontractors and Service representatives shall be conducted on site.
48. The Permittee is responsible for obtaining all necessary State and Federal permits and submitting copies to the Refuge Manager prior to the start of construction.

49. Prior to commencing construction of the Facilities, the “construction boundary”, as shown on the site plans provided in the Plan of Development, shall be clearly marked in a manner that will survive and be evident throughout construction of the Facilities.
50. Permittee will proactively protect vegetation and soil using a paneled mat system (Duradeck®, AlternaMATS®, GreatMats® or equivalent) where wheeled or tracked equipment is used and where levels of foot or other traffic risk damage to the vegetative mat, soil displacement, or exposure of soil.
51. If construction is not commenced within one (1) year after permit issuance, the Service may cancel the permit.
52. Upon completion of construction, the Permittee will file two copies each of a Certification of Completion and as-built drawings and survey with the Chief, Division of Realty and Natural Resources, as proof of completion of construction.

### **Continuance of Operations**

53. Prior to September 30 of each year during the term of this Permit, a Plan of Annual Operations for annual maintenance, refueling operations, and other planned visits to the Facilities will be submitted to the Refuge Manager for approval. Included in the plan will be the following:
  - a. Refueling and annual maintenance of the Facilities will be conducted during the periods December 1 through February 28 or August 1 through October 24 to avoid denning bears, nesting season, and the main concentration of public use taking place on the refuge during the summer and fall and .
  - b. The Refuge Manager will be notified no less than fourteen days prior to commencement of annual maintenance or refueling operations.
  - c. Flight routes to and from the Facilities which must avoid concentrated public use areas and sensitive wildlife areas to be identified by the refuge in advance
  - d. Subsequent plans must be submitted annually for approval and must be received by the Refuge office 30 days before the expiration of the current plan.
54. Permittee shall notify the Refuge Manager of any and all occurrences that require or necessitate emergency repairs/maintenance to the Facilities prior to commencement of activities if possible.
55. No later than January 15 of each year during the term of this permit, the Permittee will provide a report to the Refuge Manager that details the previous year’s activities at the Facilities. This report will include:
  - a. All helicopter flights to each site during the previous year including actual # of flights, dates of flights, aircraft used and actual flight paths.

- b. The amount of fuel consumed at each site during the previous year (refuel to refuel).
- 56. Any service interruptions during the previous year as a result any equipment failures or other causes at these Facilities, along with the cause and duration of those service interruptions.
- 57. The Permittee is responsible for ensuring that all persons working for the Permittee and conducting activities including but not limited to contractors and subcontractors allowed by this permit have been given a copy of this Permit, have been briefed on the terms and conditions of this Permit and shall adhere to the conditions of this permit. A copy of this Permit will be kept on site at all times during construction and during major and scheduled maintenance of the Facilities.
- 58. The Permittee's contractor(s) will develop and have on site a Spill Prevention Control and Countermeasure Plan, as applicable. A copy of this plan will be submitted to the Refuge Manager prior to commencement of construction. If a spill does occur, the Refuge Manager would be notified immediately. A bond would be required of the permittee in order to ensure funding is available for any necessary contaminant clean-up.
- 59. All hazardous wastes (as defined by the Resource Conservation and Recovery Act of 1976, as amended) will be stored, transported, and disposed in accordance with regulation requirements.

#### **Conservation Measures**

- 60. Placement of erosion and sedimentation controls as needed during construction and stabilization of disturbed areas during and immediately following construction will be required. Equipment use will be limited to the construction boundary shown on the site plans.
- 61. Impacts associated with trampling, crushing, or collision of vegetation are to be avoided to the maximum extent possible. Staging of construction equipment and supplies will also occur in locations devoid of vegetation where possible. Construction equipment, supplies and helicopters would be inspected and cleaned as necessary prior to transport to the microwave antenna sites to minimize potential for the introduction of invasive species to the sites. During the annual maintenance visit, the site will be inspected for the growth of invasive plants. If invasive plants are found at a site; the permittee, with guidance from the Refuge, would develop and implement a plan for eradication.
- 62. A 1/2 mile no fly zone around seabird colonies will be in place from May 15 to Sept 15. If a flight is needed outside of these parameters, the permittee shall receive written approval from the authorizing official prior to flight.
- 63. Construction will occur between July 1 and October 24 and maintenance and refueling activities will occur between December 1 and February 28 or August 1 to October 24 so as to not disturb denning brown bears, nesting birds, recreationists, or subsistence users.

64. Barge traffic will remain at least three nautical miles from any sea lion haul-out or rookery during transit to and from the staging and refueling areas and helicopter traffic during construction, maintenance and refueling will remain at least three nautical miles from sea lion haul-outs.
65. While working in the staging area, the Permittee will only operate in the location(s) designated by a qualified archaeologist.
66. Towers and sheds will be tan in color or with a matte finish to help them blend into the environment as much as possible.
67. The transportation and presence of any pets and other live animals of any kind to or on the Facilities are prohibited.
68. The Permittee's employees, contractors, subcontractors and any other individuals authorized to access the Facilities by the Permittee are prohibited from carrying or transporting firearms on and to the Refuge. Firearms to be used for safety purposes and only carried by a bear guard are permitted on the Facilities. A bear guard is defined as an employee of the Permittee or its contractors or subcontractors who has had 8 hours of bear awareness training.
69. The Permittee's employees, contractors, subcontractors and any other individuals authorized to access the Facilities by the Permittee are prohibited from hunting, fishing, and trapping while on the Refuge during construction, maintenance, refueling and emergency repair operations.
70. All helicopter flights to and from the sites will maintain a minimum altitude of 2000' AGL, weather permitting.
71. All food wastes will be stored in animal-proof containers and disposed on a weekly basis at a permitted off-Refuge facility.
72. All human waste will be removed from the site. All gray and black water or chemical toilet refuse generated at construction or production facilities will be transported off the Refuge to permitted treatment or disposal facilities.
73. Burning of trash, solid waste or any other substances or materials is prohibited. All trash and non-petroleum solid waste imported to or generated on the Facilities will be hauled off the Refuge and disposed in accordance with 18 AAC 60 (Solid Waste Regulations) and with 18 AAC 62 (Hazardous Waste Regulations).
74. ATV use shall not be permitted.
75. The Permittee shall be responsible for keeping the construction area clean. All trash, survey lath and other debris shall not be stored on site. All trash, survey lath and other debris shall be picked up daily and properly disposed of during the job. At the completion of construction, a final cleanup shall be conducted by the Permittee and approved by the Refuge Manager.

76. Permittee shall be responsible at all times during the life of this Permit for taking any and all actions to prevent introduction of invasive species on the Refuge. During each year for three years following construction and every five years thereafter, Permittee will be required to conduct a survey for invasive species at the Facilities and surrounding area. A report on this survey will be provided to the Refuge office no later than January 15 of each year following the survey.
77. Permittee will do everything reasonably within its power, both independently and on request of any duly authorized representative of the United States, to prevent and suppress fires on or near lands to be occupied under this permit, including making available such construction and maintenance forces as may be reasonably obtainable for the suppression of such fires.
78. Permittee must take such soil and resource conservation and protection measures on the land covered by the easement or permit as the Refuge Manager may request.
79. Any problems with wildlife must be reported immediately to the Refuge Manager. The Permittee, contractors, subcontractors and employees shall not feed animals. Wildlife shall not be harassed or intentionally approached closely enough to disrupt the animal's activity or to endanger human life. There shall be no taking of any animal except in the case of defense of life and property. In the case of a defense of life and property taking, the Permittee shall immediately contact the Alaska Department of Fish and Game and the Refuge Manager, and salvage those parts of the animal required by State regulations.
80. Permittee will comply with the Archaeological Resources Protection Act (16 U.S.C. 470aa). The disturbance of archaeological or historical sites and the removal of artifacts from Federal land is prohibited. If such sites or artifacts are encountered, the Permittee will immediately cease all work upon Federal land and notify the Refuge Manager.
81. The Permittee shall report any instances of dead birds found in the project area to the Refuge Manager or his/her representative in a timely manner.
82. Permittee shall avoid harassing or interfering with non-game wildlife, including land animals, marine mammals, waterfowl, seabirds, and other migratory birds.

## **Appendix G. ANILCA Section 810 Subsistence Analysis**

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### **Project Description:**

The Proposed Action and Preferred Alternative (Inner Route or Alternative 2) under review in this EA includes construction, operation, and maintenance of two remote microwave repeater tower sites located at:

- Midridge (T29S R27W, Section 24 Seward Meridian); and,
- Larsen Peak (T30S R28W, Section 4 Seward Meridian).

Each of these sites is located on a ridge top and would be approximately 1/3 acre in size. During construction a slightly larger area would be affected for helicopter landing, storage of materials, and work space for personnel. The staging area would be on a private property in Village Islands. A barge for transporting equipment and construction materials would be landed on these private lands and helicopters would be used to transport materials, equipment and personnel between this private parcel and the two tower sites listed above. During a two month construction season starting after July 1, 2016, approximately 70 roundtrip helicopter flights between Village Islands and each of the tower sites would be expected.

Once the towers are in place one helicopter flight from City of Kodiak to each tower site would be expected two times each year for maintenance. Once every 18 months, the tower sites would be refueled from a barge located in the waters around Spiridon Peninsula by approximately 20 helicopter flights for each tower. These refueling sites would be limited to times of the year which would most avoid disturbance of denning bears and the main fishing and hunting seasons.

### **Current level of use (commercial, sport, and subsistence) in the affected area:**

The people most affected by this project live in the communities of Karluk, Larsen Bay, and Village Islands. A large majority of this population depends on subsistence activities for food resources (ADCCED 2015 and 2015a). In 2003 (most recent available data), residents of Larsen Bay harvested a variety of salmon and marine fish, marine and land mammals, marine invertebrates, and berries. In 1991 (most recent available data), residents of Karluk harvested a variety of salmon and marine fish, marine and land mammals, marine invertebrates, and berries (ADF&G 2015b). There is no data for Village Islands, as it is not an incorporated community. There is also documentation of Larsen Bay and Karluk residents relying on subsistence harvest of birds and their eggs (Naves 2015). Based on information gathered by ADF&G, Larsen Bay and Karluk residents rely most heavily on salmon and non-salmon marine fish and less on marine invertebrates and large land mammals for food (ADF&G 2015b).

According to the Refuge Comprehensive Conservation Plan (2006), most subsistence fishing likely occurs off the Refuge and under state regulations. Deer, elk, goat, and bear hunting occur both on and off refuge lands. As noted previously, there are federal subsistence hunting regulations for deer, elk, and brown bear, although elk are not present on Kodiak Island. All goat hunting occurs under state regulations (Williams 2003).

The following table shows the seasons and limits for the species most often used for subsistence in the area of Larsen Bay and Karluk.

<b>Alaska State Hunting &amp; Trapping Seasons &amp; Limits</b>		
Brown Bear (Fall)	One bear every four regulatory years by permit (includes spring hunt)	Oct 25 – Nov 30
Brown Bear (Spring)	One bear every four regulatory years by permit (includes fall hunt)	Apr 1 – May 15
Deer	Three deer total	Aug 1 – Sept 30 (Bucks Only) Oct 1 – Dec 31 (Any Deer)
Goat	One goat by permit	Aug 20 – Oct 25
<b>Federal Subsistence Hunting Seasons &amp; Limits (Kodiak Refuge Lands Only)</b>		
Brown Bear	3 permits for the community or Larsen Bay and 1 permit for the community of Karluk	Dec 1 – Dec 15 & Apr 1 – May 15
Deer	3 deer	Aug 1 – Jan 31 Antlerless only Oct 1 – Jan 31
<b>Migratory Bird Hunting Seasons &amp; Limits (Oct 8 – Jan 22 for all)</b>		
Ducks	7 per day, 21 in possession	No more than 1 canvasback per day, 3 in possession
Sea Ducks (residents)	10 per day, 20 in possession	Steller's and spectacled eiders closed statewide. Buffleheads and goldeneyes are not considered sea ducks.
<b>Subsistence Migratory Bird Harvest Seasons &amp; Limits (Apr 2 – Aug 31)</b>		
Seabirds & eggs	No limit.	Apr 2–Jun 30 & Jul 31–Aug 31
All other birds & eggs	No limit.	Apr 2 – Jun 20 & Jul 22 – Aug 31
<b>Alaska State Sport Fishing Seasons &amp; Limits (Fresh Water)</b>		
King Salmon	$\geq 20$ inches – 2 per day, 2 in possession, Annual limit of 5 fish.	Year Round. Dog Salmon drainage closed. Ayakulik and Karluk Rivers closed Jul 26 – Dec 31.
King Salmon	$< 20$ inches – 10 per day, 10 in possession	Year Round. Dog Salmon drainage closed. Ayakulik and Karluk Rivers closed Jul 26 – Dec 31.
Other Salmon	$\geq 20$ inches (combination of all species) – 5 per day, 10 in possession.	Year Round
Other Salmon	$< 20$ inches – 10 per day, 10 in possession	Year Round
Rainbow/Steelhead Trout	2 per day, 2 in possession	Only 1 of which may be $\geq 20$ inches. Annual limit of 2 fish.
Dolly Varden & Arctic	10 per day, 10 in possession	Year Round

Grayling		
Other Species	No limit	Year Round
<b>Alaska State Sport Fishing Seasons &amp; Limits (Salt Water)</b>		
King Salmon	2 per day, 2 in possession.	No annual limit.
Other Salmon	5 per day, 10 in possession.	No annual limit.
Rainbow/Steelhead Trout	2 per day, 2 in possession	Only 1 of which may be $\geq 20$ inches. Annual limit of 2 fish.
Dolly Varden	10 per day, 10 in possession	Year Round
Lingcod	2 per day, 4 in possession	Jul 1 – Dec 31
Sharks	1 daily, 1 in possession	Annual limit of 2.
Spiny dogfish	5 daily, 5 in possession	
Halibut	2 per day, 4 in possession	Feb 1 – Dec 31
Rockfish	5 per day, 10 in possession	
King Crab		CLOSED
Dungeness Crab	6 ½ inches or more. Males only. 12 per day, 12 in possession	Males only.
Tanner Crab	5 ½ inches or more . Males only. 6 per day, 6 in possession.	July 25 – Feb 10
<b>Alaska State Subsistence Fishing Seasons &amp; Limits</b>		
Fisheries, besides those listed below	No limit	Jan 1 – Dec 31
Lingcod		Jul 1 – Dec 31
Herring	500 pounds per calendar year	Jan 1 – Dec 31
Halibut	2 per day, 4 in possession	Cannot “double up” with sport fish limit.
Karluk River King Salmon	May be closed	
<b>Federal Subsistence Fishing Seasons &amp; Limits (Federal waters only)</b>		
Fisheries, including salmon, except those listed below	No limit	Year round
Rainbow Trout / Steelhead	May be taken incidentally when fishing for other species.	Year round
Herring	No limit	Year round

**Evaluation:**

Construction: Construction activities would be required to occur starting after July 1 and ending before Oct 1 and would only last one season. The construction sites on Midridge and Larsen Peak would be accessed from Village Islands via an overland route by helicopter. Helicopter flights would be limited to 2000 ft above ground level (AGL) in order to minimize disturbance to wildlife and people using the area.

By the beginning of construction season (after July 1) the spring bear and subsistence bird seasons are over, but the red and silver salmon fishing seasons would be in full swing as most fishing for these species occurs from July through September. Although the timing overlaps, the

majority of construction work would not be near the marine area where most fishing takes place, but on ridge tops where few subsistence activities are done. If the weather is workable, construction could be done in as little as one month, but may stretch to two months, ending in late August. The deer hunting season begins in August, but the peak of this season is later in the fall allowing for hunting beyond the construction season. The fall bear hunt occurs after the construction season. The construction sites are not within areas used for subsistence, but the helicopter flights would cross areas being used.

Although construction requires many helicopter flights they are not expected to change the distribution or movements of wildlife significantly, as the overflights would be recommended to be at least 2000 ft AGL.

**Maintenance:** The semi-annual maintenance flights will be limited to times of the year which would most avoid disturbance of denning bears and the main fishing and hunting seasons. In general, flights would be limited to the fall, before bears go into their dens and before the peak of deer season, or very early spring before bears emerge from their dens. Once on site, maintenance activities would be barely noticeable by area users.

**Other Alternatives & Available Lands:**

In the Environmental Assessment (EA) for the Proposed Kodiak Microsystems LLC Broadband Telecommunications Tower Project, other alternative locations were evaluated. Alternatives to cross the island from Japanese Bay were dismissed without further evaluation due to the greater number of towers required, the prime brown bear habitat that they would cross, and their higher costs. An alternative to place three towers closer to the coast was evaluated in the EA, but it was determined to not be the preferred alternative due to the additional tower required (and subsequent increase in helicopter flights for construction and maintenance), the greater visibility of the towers, and their proximity to sea lion haul-outs and seabird colonies.

Although the two 1/3 acre tower sites would be disturbed throughout the life of the project, there are no other restrictions to the use of refuge lands around the towers.

**Finding:**

This evaluation concludes that the action will not result in a significant restriction of subsistence uses.