

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 99615**

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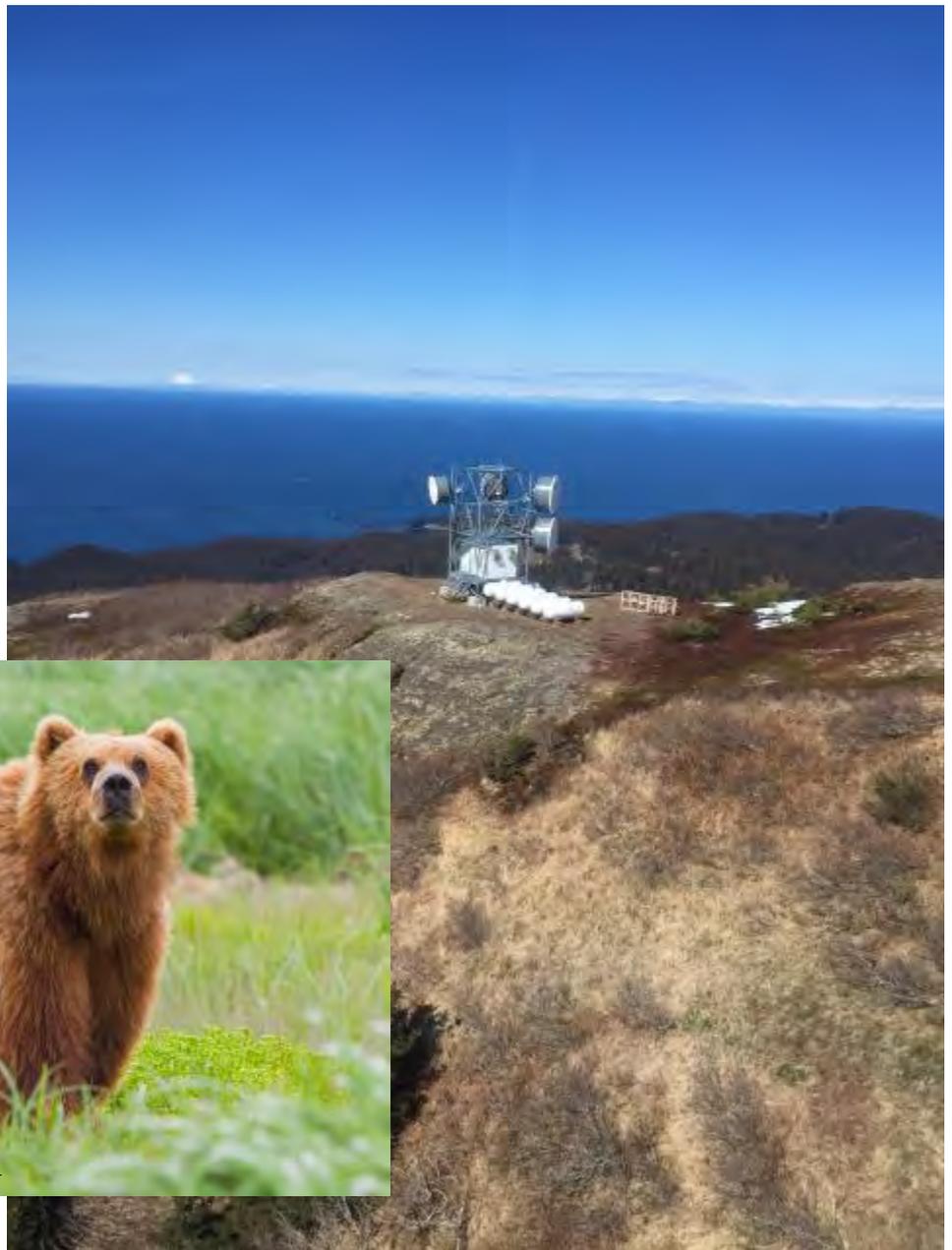


Photo by Yathin Krishnappa

**U.S. Fish & Wildlife Service
Environmental Assessment
For the
Kodiak Microwave Systems, LLC Telecommunications Project,
Kodiak National Wildlife Refuge, Kodiak Island, Alaska**

This 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

The U.S. Fish and Wildlife Service (FWS, Service) is considering an application from Kodiak Microwave System, LLC (KMS) to construct a telecommunications project (KMS4), consisting of several remote microwave repeater stations (towers), on the northwest side of Kodiak Island within the Kodiak National Wildlife Refuge (Kodiak Refuge). The project would provide broadband telecommunications services to the remote communities of Larsen Bay and Karluk. These communities currently utilize private satellite networks for telecommunications. These satellite telecommunication networks have limited usefulness due to often slower speeds, frequent delays in connectivity, and low reliability. Without access to broadband internet, Larsen Bay and Karluk lack access to modern educational tools, telemedicine, and economic opportunities. This project would address the need for improved broadband services in Larsen Bay and Karluk by providing high-capacity, high-speed, and low delay connectivity. The improved internet connectivity and reliability would provide residents with increased opportunities to facilitate economic development, and would improve services for health care providers, schools, government, tribal and non-profit entities, and residential users.

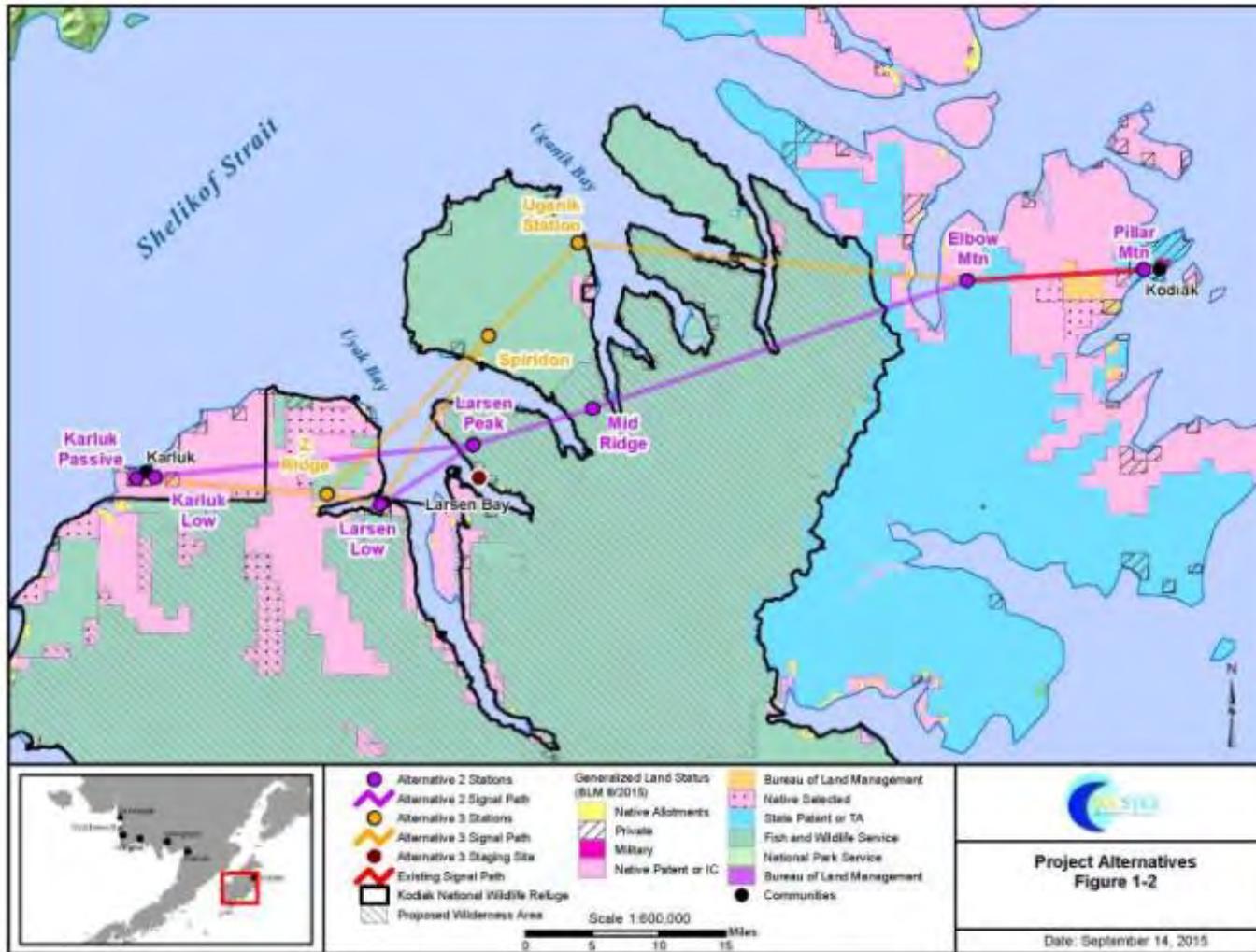
Alternative 2 is the proposed route by the applicant and would include one microwave repeater station at Larsen Peak and another at Midridge (Alternative 2 (Inner Route)). Alternative 3 (Outer Route) was developed as an additional viable route for consideration whereby three stations would be constructed at Spiridon, Uganik, and Z-Ridge. These would be closer to the coast than those for Alternative 2. Construction of the project is proposed for summer of 2016. Currently there are no installations on Midridge or Larsen Peak. Service radio repeaters were located on Spiridon and Z-Ridge, but are being removed in summer 2016. If approved, a Federal right-of-way (ROW) would be granted to KMS to build the remote microwave repeater stations on the Refuge (Figure 1-1).

Preferred Alternative Selection

After evaluation of the project and alternatives, the *preliminary* preferred alternative was determined to be Alternative 2 (Inner Route), the originally proposed action to build repeater stations at Midridge and Larsen Peak. Although the facilities associated with Alternative 2 would be located on lands with wilderness values, they would be less visible, further from critical sea lion haul-outs and seabird colonies, and would require many fewer helicopter flights for construction and maintenance over the life of the project than would facilities associated with Alternative 3 (Outer Route).

During the comment period, the applicant informed the Service that Alternative 2 was no longer a viable alternative, because a co-location agreement for use of the Elbow Mountain tower owned by Kodiak Electric Association could not be completed. The Service also received a letter from the Koniag Corporation voicing support for the development of another alternative (Alternative 3). As a result of these comments, the Service revised its preference and now considers Alternative 3 (Outer Route) to be the preferred alternative. Alternative 2 has been re-categorized as an Alternative Considered and Dismissed.

Figure 1-1: Facility Locations for Alternatives 2 and 3



1.1 PURPOSE AND NEED

The purpose of this Environmental Assessment (EA) is for the Service 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), Service will evaluate the potential impacts of the proposed action and decide whether or not to issue a ROW permit to build and maintain these microwave repeater stations 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

Table 1-1: Evaluation Criteria

Kodiak Microwave Systems LLC Project Objectives	U.S. Fish & Wildlife Service Project Objectives
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 and Steller’s sea-lion haul-outs will be minimized.

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

The Service 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 50 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) consolidated the various categories of lands administered by the Secretary of the Interior through the Service 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 the Service to permit the location of telecommunication facilities within the Kodiak Refuge.

The *Alaska National Interest Lands Conservation Act of 1980*, 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 could have the potential to significantly restrict subsistence users (Title VIII), and required the agencies complete a specific analysis of impacts and alternatives when considering the installation of components of a utility system within a federal conservation unit (Title XI) (see below).

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”, ANILCA Title III re-designated the Refuge with additional 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 was completed in May 2016. No historic sites were found to be adversely affected by the activities proposed in this EA (Appendix H).

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. After the comment period, an updated informal intra-agency consultation was completed by FWS in June 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 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 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 Refuge lands but will be installed on State of Alaska or private lands. These components include three microwave towers (Larsen Low, Karluk Passive, and Karluk Low) and associated facilities. 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 near Village Islands, Larsen Bay, and Karluk 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 the Service, KMS, and Solstice Alaska Consulting, Inc. (Solstice) met via teleconference on May 29, 2015, to discuss the project. These representatives decided to notify and engage the public by publishing a notice in the *Kodiak Daily Mirror* on June 5, 2015 to advise local communities of the proposed project and how to submit questions, ideas, or concerns. The comment deadline was July 6, 2015. A copy of the notice is included in Appendix A. Additionally, in June 2015 letters were sent via mail and email to all the big game guides permitted to operate on the Refuge. 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 16th instead of May 1st 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

The preliminary EA was released on May 4, 2016, for public review and comment. Letters were sent to the permitted big game guides, KMS, and Steele Davis who had commented during the scoping period in 2015.

Issues raised during the comment period include:

- KMS commented that Alternative 2 was no longer viable and that Z-Ridge site was needed for both alternatives.
- Koniag Corporation commented that Alternative 3 was the route that should be pursued.
- Steele Davis commented that the effects of microwaves on wildlife species should be considered and had many questions regarding the economics of the project.

Copies of the comments letters are included in Appendix I along with the Service's responses to these concerns.

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 four 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.

Additionally, Koniag Native Corporation was consulted regarding the potential for traditional cultural properties in the area. No cultural properties of concern were identified.

The tribes and corporations were contacted on May 4, 2016, when the draft EA was released for comment. Only comments from Koniag Native Corporation were received. A follow-up letter was sent to these same organizations informing them of the change in preferred alternatives on June 2, 2016. No comments were received.

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 1-2. The issue will not be discussed further in the document. Issues being further considered are listed in Table 1-3. These issues will be further discussed in Chapter 3 Affected Environment and Chapter 4 Environmental Consequences.

Table 1 - 2: 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. Equipment being used during construction would be powered by a gasoline-powered engine which is expected to generate minimal exhaust.
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 floodplains.
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. 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 - 3: 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 facilities 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 facilities 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 habitats to that being proposed for the repeater stations.
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 concurrence from NMFS for our determination is included in Appendix D and documentation of informal consultation within the Service is included in Appendix C.
Cultural Resources	According to the Cultural Resources Report prepared for this project, there are no known cultural sites at the proposed sites, and no cultural resources are expected to be adversely affected at the staging areas. The State Historic Preservation Officer (SHPO) has been consulted and a letter of concurrence has been received. It is included in Appendix H.
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 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 microwave repeater stations in these areas would require a change to the land management status from "Minimal" to "Moderate" management.
Recreational Use	Lands located near the proposed microwave repeater stations are also used by commercial guides for hunting and fishing and by other Refuge visitors for backcountry experiences.
Noise/Soundscape	The proposed microwave repeater stations will require a significant number of helicopter flights for construction and additional flights for maintenance and refueling every year. 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 original Proposed Action (Alternative 2 or Inner Route) under review in this EA included the construction, operation, and maintenance of two remote microwave repeater stations at:

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

Due to comments received after the release of the draft EA, this originally proposed action alternative was determined to be unfeasible for implementation. It is now considered in Section 2.8 Alternatives Considered but Dismissed.

The current proposed action (Alternative 3 or Outer Route) under review in this EA includes the construction, operation, and maintenance of three remote microwave repeater stations at:

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

This Outer Route alternative, 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 Service decision document, and not included in this EA.

2.2 ALTERNATIVE 1 (NO ACTION ALTERNATIVE)

Under the no action alternative, the Service would not grant a ROW and the proposed project would not go forward on Refuge lands. This alternative will be used, in this EA, as a baseline from which to compare potential changes to the human environment resulting from the action alternative.

2.3 ALTERNATIVE 3 (OUTER ROUTE) - SITE DETAILS

When fully installed, each microwave repeater station 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), or 0.33 acres, would be affected at each site. Additional components, reviewed only in relation to cumulative effects and not subject to analysis in this EA, include a passive microwave repeater station near Karluk, active microwave repeater stations in the communities of Larsen Bay and Karluk, and associated infrastructure installed on non-federally-managed lands. Active repeater stations require energy in order to “actively” transmit a microwave signal. A “passive” repeater station only reflects the signal into a new direction.

Table 2 - 1: Description of the Components of Each Active Microwave Repeater Station

Facility	Dimensions	Description
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 tan 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 (ranging from 15-25 ft below ground surface).
Antenna Color	Neutral	To make the antennas less visible, any antennae will be a tan 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. These would be prefabricated and mounted on foundation piers underneath the tower. 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 protected box suspended about 8 ft above ground. The box would shield the lines from ice and animal damage.
Generators	N/A	Propane powered fuel cells would be used to charge a 25 cell nickel-cadmium battery plant (2 volt) at each station. 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 enclosure just outside the communications equipment shelter.
Propane tanks	Five tanks each holding 500 gallons	The active microwave repeater stations would each house a maximum of five 500-gallon propane tanks (2,500 gallons total). The tanks would have automatic shut off valves 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 Site Plan

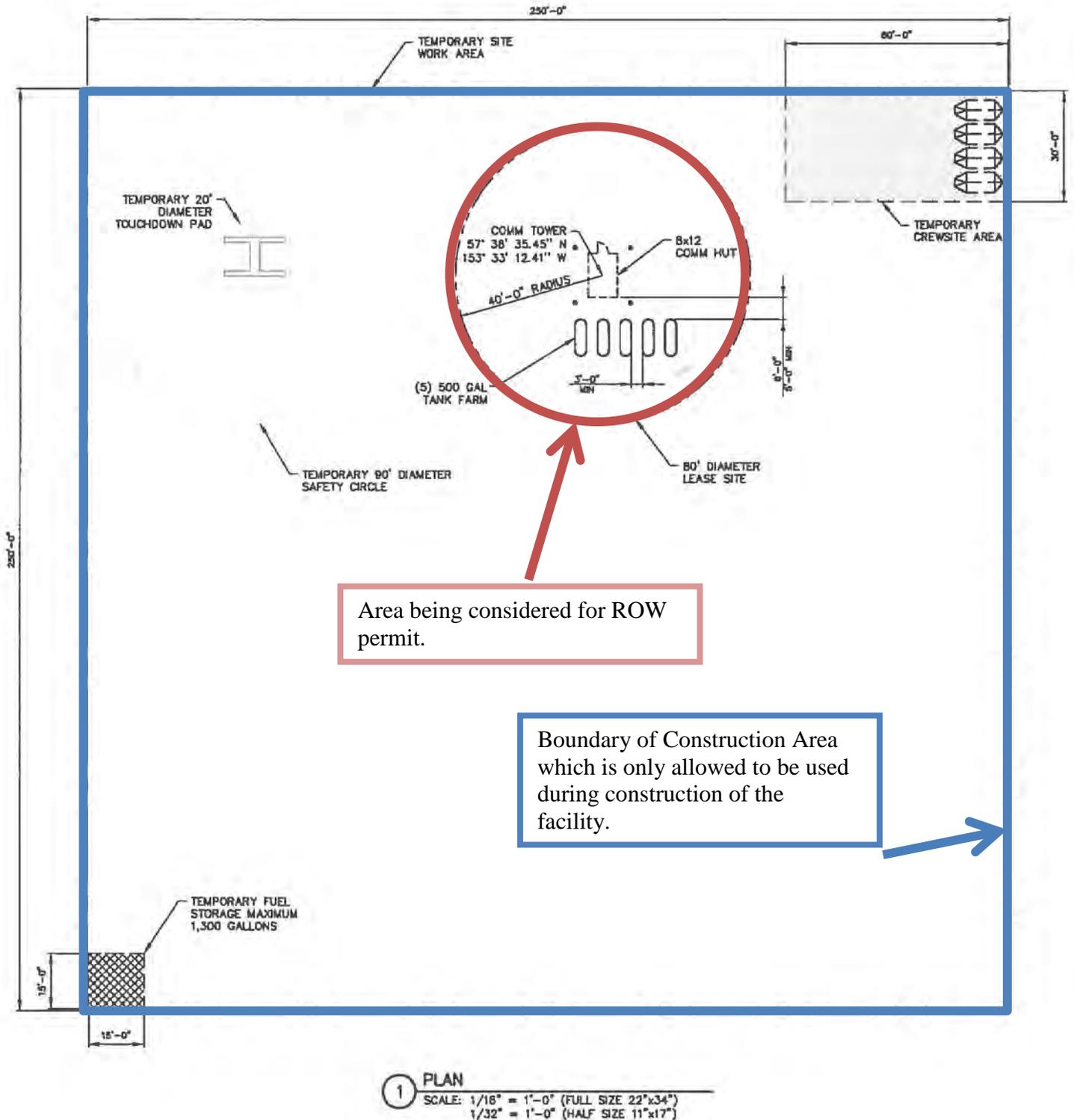




Figure 2-2. A microwave repeater station similar to those proposed for the Kodiak Refuge.

2.4 ALTERNATIVE 3 (OUTER ROUTE) - CONSTRUCTION DETAILS

During construction, a 250 ft by 250 ft (62,500 sq ft or 1.43 acre) area would be affected at each site. Table 2-2 describes temporary construction facilities associated with installing the microwave stations. Equipment proposed to construct the communication facilities was selected based on construction requirements and the weight restrictions of the type of helicopter anticipated to be available during construction. Considerations were given to the helicopter’s load carrying capacity, size of equipment, and the amount of equipment needed 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 engine 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.

Table 2 - 2: Description of Construction Facilities

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. R-66 and R-44 helicopters would be used for the daily transport of crew and lighter materials. A 204 Huey would support

Facility	Dimensions	Description
		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 each station. The area would be delineated, with markings to be 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 area. 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 portable containment ponds located at the off-refuge construction staging area and flown to the construction sites as needed. Two 55-gallon drums of diesel for equipment and camp heaters, two 55-gallon drums of gasoline for equipment, and one 55-gallon drum of Aviation Gas for emergency refueling, plus three 5-gallon cans of gasoline will be at each 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 portable containment pond within a temporary fuel storage area.
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 live in this area during the construction of the repeater station. The crew will remain on-site unless weather conditions require them to move to the staging area.

Construction is expected to take approximately 14 days at each site; however, the construction schedule is weather dependent and could be accelerated or delayed.

Table 2-3: Additional Construction Details of Stations Being Built on Refuge Lands

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

2.5 ALTERNATIVE 3 (OUTER ROUTE) - OPERATION AND MAINTENANCE

KMS expects two trips to each microwave repeater station annually to perform operational checks and maintenance activities. An R-66, R-44, Bell 204 or similar helicopter would be used. Refueling of the propane tanks would require 20 trips with an R-66 or R-44 helicopter. Refueling could occur in one day every 18 months. Once constructed, the life of this project is considered to be 20 years.

2.6 IMPACT SUMMARY MATRIX

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

Table 2 - 4: Summary of Anticipated Impacts

AFFECTED ENVIRONMENT	NO ACTION - ALTERNATIVE 1	OUTER ROUTE – ALTERNATIVE 3
Soils	No changes to soil resources.	Negligible, direct, long-term adverse impacts would be expected. A total of 108 cubic ft of soil displaced over 3 sites and at each site approximately 0.33 acres would be disturbed.

AFFECTED ENVIRONMENT	NO ACTION - ALTERNATIVE 1	OUTER ROUTE – ALTERNATIVE 3
Vegetation	Vegetation would remain unchanged.	Minor, long-term adverse impacts to vegetation are expected. Vegetation would be permanently affected on 0.33 acres at each site. 1 of 3 sites is sparsely vegetated and rocky. A total of 4.3 acres would be disturbed during construction. 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.	Minor, short-term, direct impacts during construction and minor, long-term, direct impacts of a fuel spill would be possible. Storage of fuels and hazardous materials onsite creates risk of a release. However, very limited volumes during construction, containment designs, and an approved Spill Prevention Control and Countermeasure Plan (SPCC) reduce the risks. In the long term, propane gas volatilizes when released so any leaks would be dispersed in the atmosphere and not cause terrestrial harm.
Surfbird (<i>Calidris virgate</i>)	No change to current habitats.	Minor, short-term, direct impacts during construction and minor, long-term, indirect impacts can be expected through the life of the project to nesting habitat at the Uganik site. There are no expected affects to surfbird nesting habitat at the other sites associated with this alternative. In the long term, no effects are expected as refueling and maintenance will be limited to early spring and late summer, before and after the nesting season.

AFFECTED ENVIRONMENT	NO ACTION - ALTERNATIVE 1	OUTER ROUTE – ALTERNATIVE 3
Marbled Murrelet (<i>Brachyramphus marmoratus</i>)	No change to current habitat.	Minor, short-term, direct during construction and minor, long-term, indirect effects through the life of the project are expected to nesting habitat at Uganik site. 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 December 1 to February 28 or August 1 to October 24, before and after the nesting season.
Seabird Colonies	No change to current habitat.	Minor to moderate short-term effects are expected to nesting areas due to noise from dozens overflights during construction, but some disturbance will be mitigated by the helicopter flights being limited to the interior of the island and limited to 2000' AGL. No long-term effects are expected as maintenance and refueling will be limited to before and after nesting season.
Brown Bears	No change to current habitat.	Minor, direct and indirect impacts to brown bears are anticipated, because construction is limited to after July 1 and refueling and maintenance is limited to December 1 to February 28 or August 1 to October 24. Impacts would be due to noise from helicopter flights and construction activities.

AFFECTED ENVIRONMENT	NO ACTION - ALTERNATIVE 1	OUTER ROUTE – ALTERNATIVE 3
Threatened & Endangered Species (Sea Lions and Sea Otters)	No change to current habitat.	<p>Moderate, short-term, noise disturbances to feeding sea lions and sea otters at the Village Islands and Larsen Bay due to helicopter operations at the staging areas are expected.</p> <p>Minor short term disturbances at sea lion haul-outs at Noisy Rocks and Bird Rocks from helicopter flights are possible due to their proximity to the Spiridon and Uganik sites</p> <p>Sea lions and sea otters may be affected due to these disturbances but are not expected to be adversely effected due to stipulations including a 3 nautical mile no-fly zone and a no-barge zone around haul-out areas.</p>
Cultural Resources	No change to historic properties.	No change to historic properties is expected at the construction sites or staging areas.
Socioeconomic	No change socioeconomic patterns.	<p>Nominal beneficial economic effects are expected to the communities of Larsen Bay & Karluk from an improved internet connection.</p> <p>Minimal economic benefits to the communities of Larsen Bay and Karluk are expected from the construction of these repeater stations.</p>
Environmental Justice	No changes to environmental justice.	No environmental justice concerns were identified.
Subsistence	No change to current resources.	No effects to subsistence resources or opportunities are expected.

AFFECTED ENVIRONMENT	NO ACTION - ALTERNATIVE 1	OUTER ROUTE – ALTERNATIVE 3
Land Use	No change to current use.	<p>Direct, minor adverse effects include the long-term removal of 1 acre of Refuge land from public access.</p> <p>Three tower sites would be re-classified from Minimal Management to Moderate Management.</p>
Recreation	No change to current use.	<p>Minor, indirect, short-term effects to recreational uses can be expected due to helicopter flights on the Spiridon Peninsula and near the community of Larsen Bay.</p> <p>Minor, indirect, long-term effects due to a change to the visual resources of the areas of the Spiridon Peninsula and Uganik Bay can be expected.</p>
Noise/Soundscape	No additional noise.	<p>Minor to moderate short-term effects and minor long-term effects to the soundscape of the area are expected. Noise from helicopter flights would last for up to 3 months in and around the Spiridon Peninsula during construction and would occur for a short duration (1 day) 2-3 times per year for maintenance and refueling.</p>

AFFECTED ENVIRONMENT	NO ACTION - ALTERNATIVE 1	OUTER ROUTE – ALTERNATIVE 3
Visual Resources	No change to viewscapes.	Moderate, short-term effects during construction would be expected due to numerous helicopter flights. 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. Although visible, the towers will not be as noticeable from the Uganik Island cabin as it is more than 3 miles from the tower sites. The Z-Ridge tower will be easily visible from the Karluk River. Towers would be easily visible from the air, possibly affecting flight seeing activities in the area.

2.7 Alternative 3 (Outer Route) - 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 Required

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 Service policies. Absorbent material in sufficient quantity to handle 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) would 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 to ensure funding is available for any necessary contaminant clean-up.

AFFECTED ENVIRONMENT	CONSERVATION MEASURES
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 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 construction sites to minimize potential for the introduction of non-native species. During maintenance visits, 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 the surfbird and murrelet nesting seasons.
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 feet 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 construction sites. Helicopter flights will be above 2,000 feet AGL except during take-off and landing. Construction will be scheduled between July 1 and October 24 and maintenance and refueling from December 1 to February 28 or August 1 to October 24 to minimize disturbance to denning brown bears and bear hunters.
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 when possible during transit to and from the staging and refueling areas. Helicopter flights will remain at least three nautical miles from sea lion haul-outs and within described flight zones.
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, no ground disturbance is allowed at the Village Islands staging area.
Subsistence	Helicopter-supported refueling would occur between the dates of 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 between the dates of December 1 to February 28 or August 1 to October 24 to avoid the most intensive hunting, fishing and recreational activity periods.
Recreation	Helicopter-supported refueling operations would occur between the dates of December 1 to February 28 or August 1 to October 24, to avoid the main recreational seasons. Towers, buildings, and associated facilities will be tan to make them blend with the visual environment as much as possible.

AFFECTED ENVIRONMENT	CONSERVATION MEASURES
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 shall be at a minimum of 2000 feet AGL. The 2000 feet AGL is based on FAA Advisory Circular 91-36C, "Visual Flight Rules (VFR) Flight Near Noise-Sensitive Areas." Helicopter-supported refueling would occur between the dates of December 1 to February 28 or August 1 to October 24 to avoid the most intensive hunting, fishing and recreational activity periods.
Visual Resources	Towers, antennas, and sheds will be tan in color or with a matte finish to help them blend with the visual environment as much as possible.

2.8 ALTERNATIVES CONSIDERED BUT DISMISSED

Submarine Cable Alternative

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

KMS dismissed this undersea fiber route from further consideration as being neither a reasonable, economically feasible, or 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 would be viable. Years of study would be necessary, then if a feasible route were selected, construction would be difficult and require much more time to install than microwave repeater 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. System outages would be very disruptive to the communities.

Although broadband could be delivered by way of 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 these reasons 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 (listed in Section 1.2).

Alternative 2 Proposed Action – Elbow Peak to Midridge to Larsen Peak

This alternative was originally proposed by KMS in their application to the Service for a ROW permit in January 2015, and as amended, in February 2015. In March 2016, the alternative was still considered viable per email communication, but upon the release of the draft EA in May 2016, the Service was informed that due to the lack of a co-location agreement on the Kodiak Electric Association tower on Elbow Mountain, this alternative was no longer viable. Other locations on Elbow Mountain were considered, but because of the terrain between Elbow Mountain and Midridge, a line-of-sight connection was no longer possible. The Service was informed by the State of Alaska Department of Natural Resources, who holds the lease for the Kodiak Electric Association tower that the tower's lease agreement would have to be changed to a commercial lease in order to allow co-location. Due to time constraints, it was agreed that the lease agreement could not be changed.

Sheratin - Spiridon

This alternative involves microwave transmission from an existing communication complex on Sheratin directly to Spiridon. This alternative was dismissed from further consideration because KMS had constricted a tower on this site which was later destroyed by icing conditions created by the elevation and location.

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 the Service concerns that the Peak 1 microwave station would be within important brown bear habitat.

Japanese Bay- Peak 3

This alternative would involve transmitting a microwave signal from Japanese Bay to Peak 3. Larsen Bay would be served by a microwave transmission 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 tower and because the site is above 4,000 ft in elevation. Additionally, this alternative would require 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. Also, 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 would have served all the communities around the outside of Kodiak Island by microwave stations were examined; however, they were determined to be neither reasonable nor economically prudent and feasible as they involved numerous microwave stations within the 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

This chapter identifies the project area and the region of influence within which the project might have impacts. In compliance with Council on Environmental Quality (CEQ) NEPA guidelines codified in 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 1-3.

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 3-1 shows the overall area of consideration. Alternative 3 includes microwave repeater stations on the Refuge at Uganik, Spiridon, and Z-Ridge and off-Refuge at Karluk.

The existing condition of a resource area is considered the baseline against which potential effects of implementing alternatives can be evaluated.

Figure 3 - 1: Area of Influence



3.1 PHYSICAL ENVIRONMENT

3.1.1 Soils

All of the microwave repeater station sites are located on ridges. Geotechnical surveys were not conducted at the proposed 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 sites would be expected to be erodible where they occur on steep slopes.

3.1.2 Hazardous Materials

All of the sites will require temporary fuel storage for construction and long-term propane storage as described in Tables 2-1 and 2-2. Two 55-gallon drums of diesel for equipment and camp heaters, two 55-gallon drums of gasoline for equipment, and one 55-gallon drum of

Aviation Gas for emergency refueling, plus three 5-gallon cans of gasoline will be at each site during construction. The total fuel that will be temporary stored on site for construction activities would be about 290 gallons. Fuel will be stored in a temporary containment pond within the fuel storage area. In the long-term, each active microwave station 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 sites.

3.2 Biological Environment

Within the vicinity of the proposed microwave repeater stations, a wide diversity of habitats 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 (Figure 3-1).

Figure 3 - 2: Representative vegetation on the Uganik site.



3.2.1 Vegetation

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

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 3-2 provides a photograph of representative vegetation on the Uganik site.

Figure 3 - 3: 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 3-3 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.

Figure 3 - 4: Representative Vegetation on the Z Ridge Site.



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 3-4 provides a photograph of representative vegetation on the Z Ridge site.

3.2.2 Surfbirds

Surfbirds are members of the sandpiper family. They 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 natural depressions 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/kilometer². 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 construction on ridgetops should not be dismissed. Although very little is known about ground nesting by marbled murrelets it is believed to occur from mid-May through the end of August.

3.2.4 Seabird Colonies

The construction staging area for the 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 on 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. Red-faced cormorant, pelagic cormorant, black oystercatcher, and Arctic tern are list as a Birds of Conservation Concern by the Service.

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 Refuge. Approximately 180 to 200 bears use the 236 square mile (380 square kilometer) Karluk Lake drainage which is 15 by 20 miles [24 by 32 kilometers] from the Alternative 3 microwave repeater stations. This is 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 repeater 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 the Alaska Department of Fish and Game (ADF&G) (USFWS 2006).

Suitable habitats for brown bears on Kodiak vary 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 areas of the proposed microwave repeater stations as ridgelines are commonly used travel routes. However, it is unlikely that the areas in vicinity of the stations (i.e., 0.25 mile [0.40 kilometer] radius) would support extensive foraging as there tends to be little preferred herbaceous vegetation forage (e.g., long-beaked sedge [*Carex sprengelii*]) in those locations. Foraging that could occur would likely focus mainly on the extensively distributed crowberry and would occur in the fall after completion of construction.

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 the 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 repeater sites. 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	10
Noisy Islands	Barge traffic to and from Village Islands	<=3
Noisy Islands	Helicopter flights to and from Uganik Site	8
Bird Rocks	Helicopter flights to and from Spiridon Site	6

The southwest Alaska Distinct Population Segment 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 repeater stations. 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 36 miles and 24 miles southeast of the proposed Uganik tower site; 28 miles and 15 miles southeast of the proposed Spiridon tower site; and 14 miles west and 4 miles east of the proposed Z Ridge tower site, respectively. The construction staging area for the 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. The Karluk stations, which are not on refuge lands, would be staged out of Karluk. In addition to the communities, human activity in the region of influence includes seasonal and permanent subsistence fishing and hunting cabins and camps; sport fishing and ecotourism lodges, and commercial fishing setnet

sites. These facilities support subsistence, recreational, and commercial activities within and adjacent to the Refuge and on privately owned lands and may be subject to potential socioeconomic effects associated with development of the proposed project. 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 shown in Table 3-2.

Table 3 - 2: Demographic Characteristics of Karluk and Larsen Bay

Demographic Characteristics	Karluk	Larsen Bay
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 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 Kodiak Refuge Comprehensive 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). An in-depth analysis of the effects to Subsistence is included in the ANILCA Section 810 analysis included in Appendix G.

3.3.5 Land Use

With the exception of the radio repeaters at the Spiridon and Z Ridge sites (scheduled for removal in the summer of 2016), the proposed microwave tower 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 vicinities of any of the tower sites. There is one commonly used 17B easement trail west of Larsen Bay to the inlet of Karluk River. 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. All proposed microwave repeater stations on refuge lands are in areas designated as minimal management in the Revised Kodiak Refuge Comprehensive Conservation Plan (USFWS 2006).

The regions of influence of the microwave repeater stations are used for a variety of recreational purposes, which attract visitors to the area. Especially important are bear viewing, fishing, other wildlife viewing, hunting, hiking, bird-watching, and photography. There are numerous private lodges near Karluk, Larsen Bay, and Uyak Bay that cater to recreationists.

The Refuge maintains two public use cabins (USFWS 2015c) within approximately 10 miles of the proposed sites (Figure 3-7). They are discussed in more detail in Section 3.3.6 Recreational Use.

Some hunting and wildlife viewing would likely occur in the areas of the proposed microwave repeater stations 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 locations.

3.3.6 Recreation

The proposed tower sites and their regions of influence are located on lands within ADF&G Game Management Unit 8. ADF&G regulates the seasons, licenses, and bag limits (ADF&G 2015h). Access to prime hunting areas is typically by chartered aircraft, boat, or 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, spring and fall, are open yearly. 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.

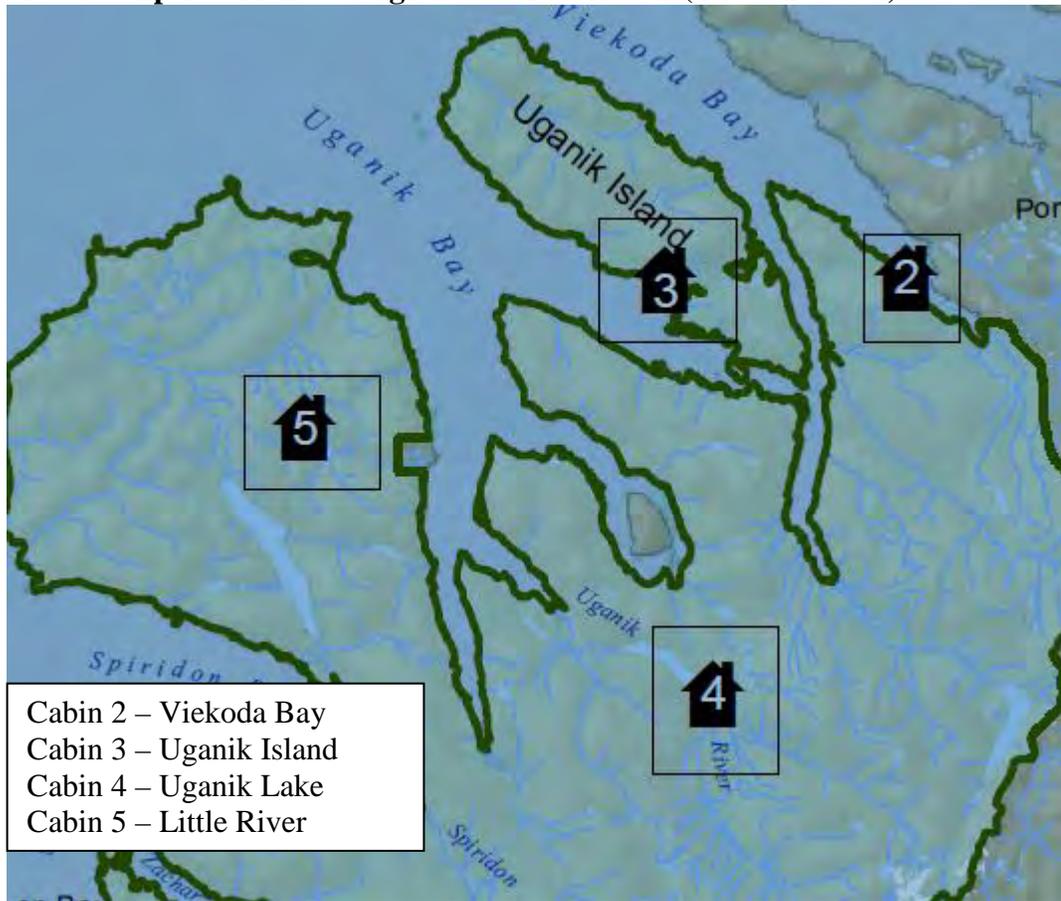
Goat and deer hunting are also popular, but more difficult to quantify than bear hunting. The hunt is administered in the project area in two areas; west and south of Spiridon Bay and drainage; and the Spiridon peninsula.

The public use cabins that are nearest to the proposed tower sites are the Little River Lake Cabin, approximately 4 miles southwest of the Uganik site, and the Uganik Island Cabin (#3), approximately 9.6 miles northwest of the Uganik site. (Figure 3-5) 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. The Z-Ridge site is not visible from any public use cabins.

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

Public Use Cabin	Average Annual Visitor Use Days	Uganik (Alt 2)	Spiridon (Alt 2)
Uganik Island	132	X	
Little River	86	X	X

Figure 3 - 5: Map of Kodiak Refuge Public Use Cabins (USFWS 2015c)



3.3.7 Noise

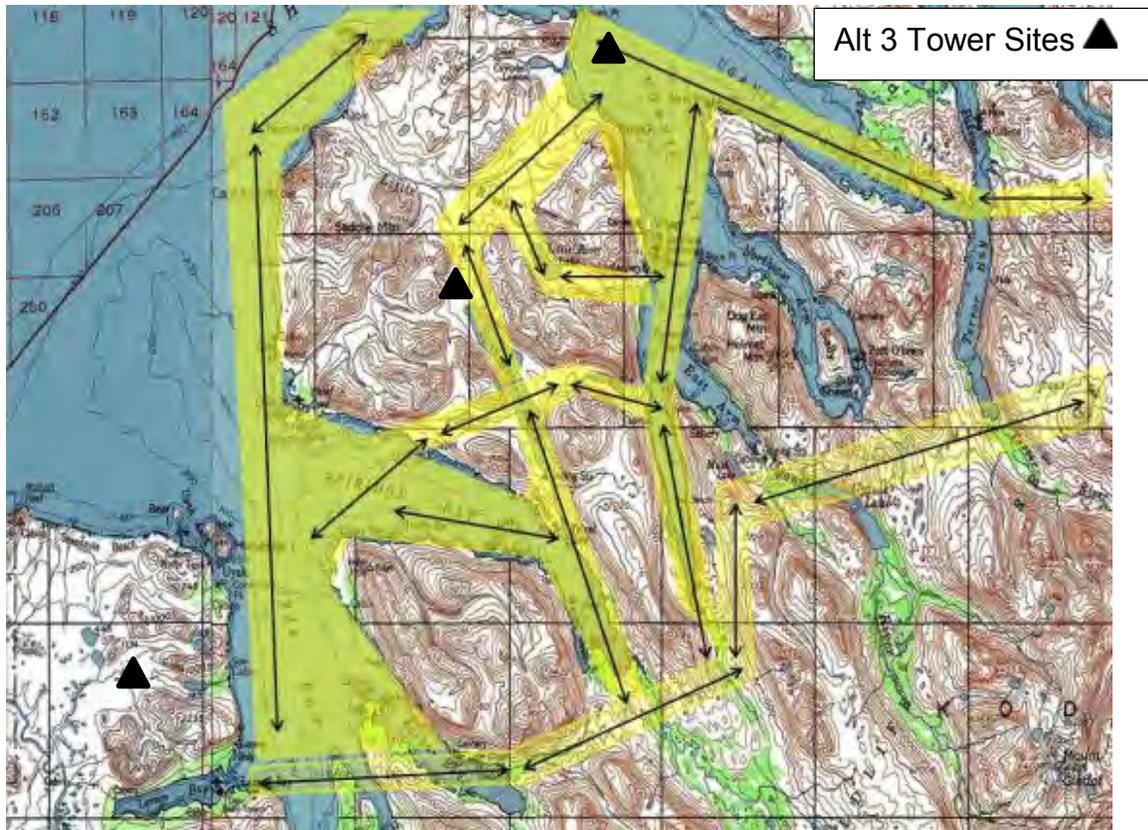
Sound is defined as a particular auditory effect produced by a given source, for example the sound of rain on the roof, and is measured decibels (dB). A-weighted sound level measurements (dBA) are a measure of how the human ear hears sound and is used to characterize sound levels. Table 3-4 shows dBA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

Table 3 - 4: dBA Levels

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
(Bolin 2006, Illingworth and Rodkin 2006, Schulten 1997, ICAO Annex 2006, US Coast Guard 2010)	

Existing noise levels in and near the microwave repeater stations are generally low and from natural sources but are periodically interrupted by airplane overflights. Figure 3-6 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 - 6: 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 proposed 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 Larsen 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.

3.3.8 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's towers, referred to as the "Seen Area" (Figures 3-10 through 3-16). 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 potential impact on Refuge visitors, the views from Refuge recreational cabins were 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 3.3.4, Section 3.3.5, and Section 3.3.6, respectively. According to the Kodiak Refuge Comprehensive 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. 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). Three viewsheds were analyzed for the purposes of this discussion. The viewsheds, centered on each of the proposed microwave repeater stations, are natural in appearance, with little nearby human development. The viewsheds are described below in terms of predominant landform, vegetation, and existing structures.

Uganik Viewshed

The viewshed of the proposed Uganik repeater station 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



Figure 3-7. Looking south towards the Uganik site.



Figure 3-8. Looking towards the repeater (blue structure) at the Spiridon site.

with the vegetated areas. Most of the Uganik viewshed is undeveloped. The Village Islands are in Uganik Bay to the east of the site. There are a few small structures along the shore of Uganik Bay. There are no existing structures in the immediate area of the proposed tower site.

Spiridon Viewshed

The viewshed of the proposed Spiridon microwave repeater station is characterized by Uyak Bay and Shelikof Straight 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, Spiridon 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 drainages. The Spiridon viewshed is undeveloped with the exception of a few small structures along the shore of Spiridon Bay. There is currently a small radio repeater station, planned for removal in 2016, in the immediate area of the proposed microwave repeater station.

Z Ridge Viewshed

The viewshed for the proposed Z Ridge microwave repeater tower is characterized by low flat wet terrain associated with the Karluk River to the north and west; the marine environment of Larsen Bay to the south; and mountains to the east. The terrain immediately surrounding the Z Ridge site drops off steeply in all directions.

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 grow on the lower side slopes of the mountains. While most of the viewshed of Z Ridge is undeveloped, the community of Larsen Bay is located on the south shore of Larsen Bay approximately 3 miles 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 leading to the Karluk River runs west from Larsen Bay. There is currently a small radio repeater station, planned for removal in 2016, in the immediate area of the proposed microwave repeater station.



Figure 3-9: Looking south towards the repeater (blue structure) site on Z Ridge.

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 in this area will include local rural residents, subsistence users, commercial fishermen, recreational/guided fishermen and hunters, guides, and wildlife (primarily bear) viewers. Local rural residents include people of Alaska Native (Alutiiq), Caucasian, and Filipino decent, 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 viewsheds of the towers in either Karluk or Larsen Bay. Commercial set net sites are dotted along the western coast of Kodiak Island from Karluk to the northern end of the island near Spruce Island, especially within the Uyak, Spiridon, and Uganik Bays.

Fishermen, 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 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.

Although 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 - 10: Locations From Which Alternative 3 Towers would be Visible.

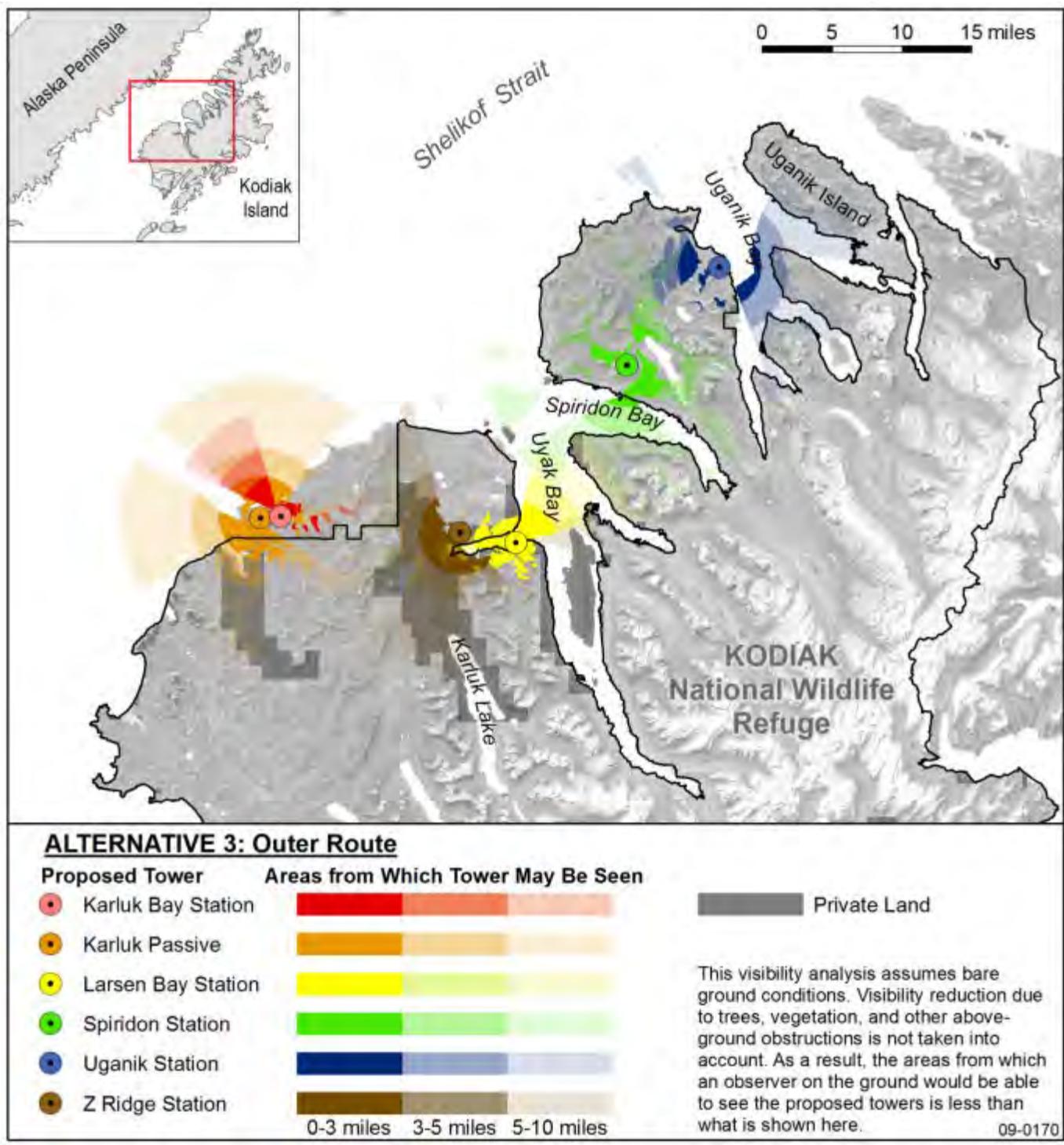


Figure 3 - 11: Locations From Which the Karluk Bay Tower would be Visible (off Refuge)

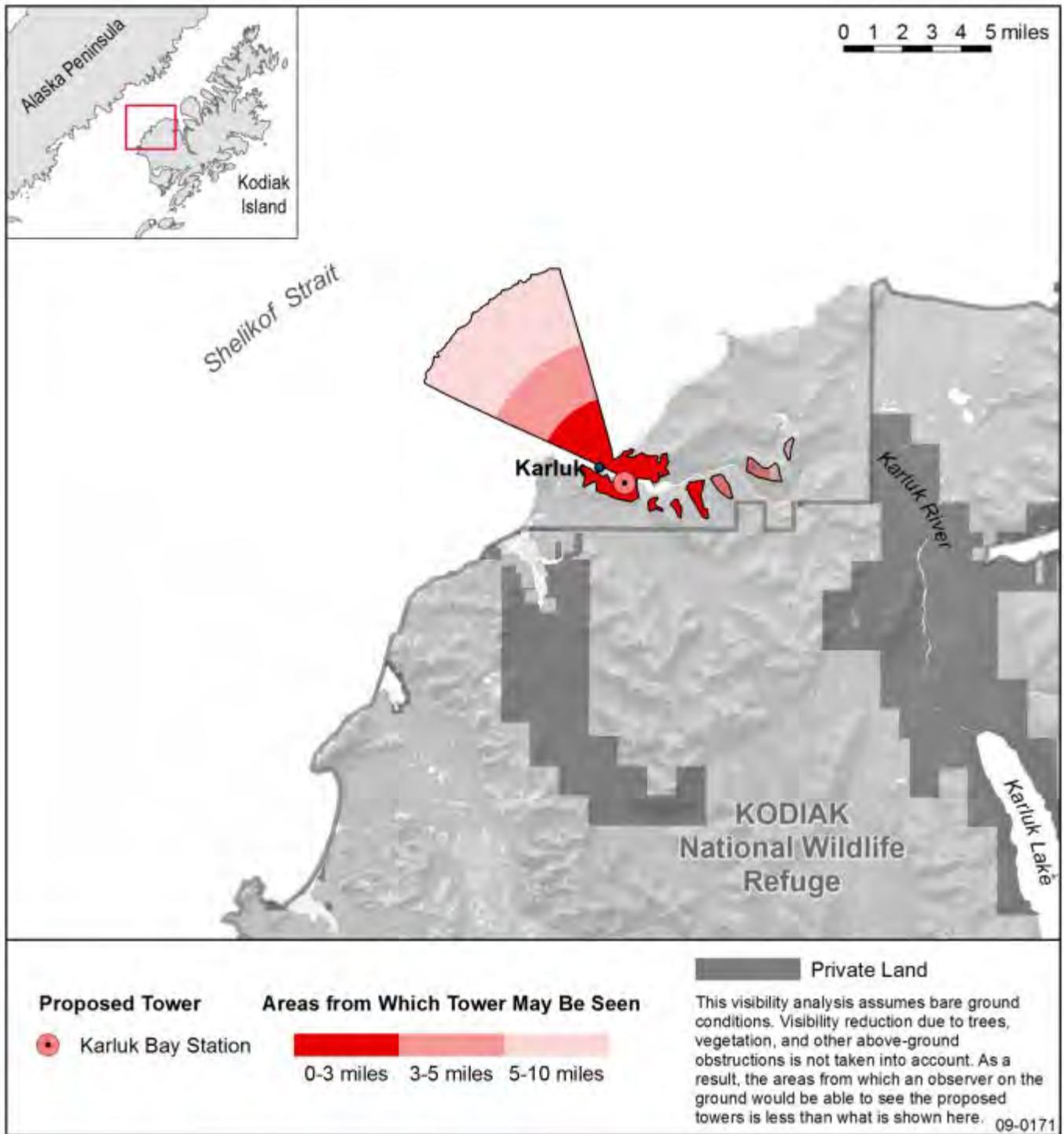


Figure 3 - 12: Locations From Which Karluk Passive Tower would be Visible (off Refuge).

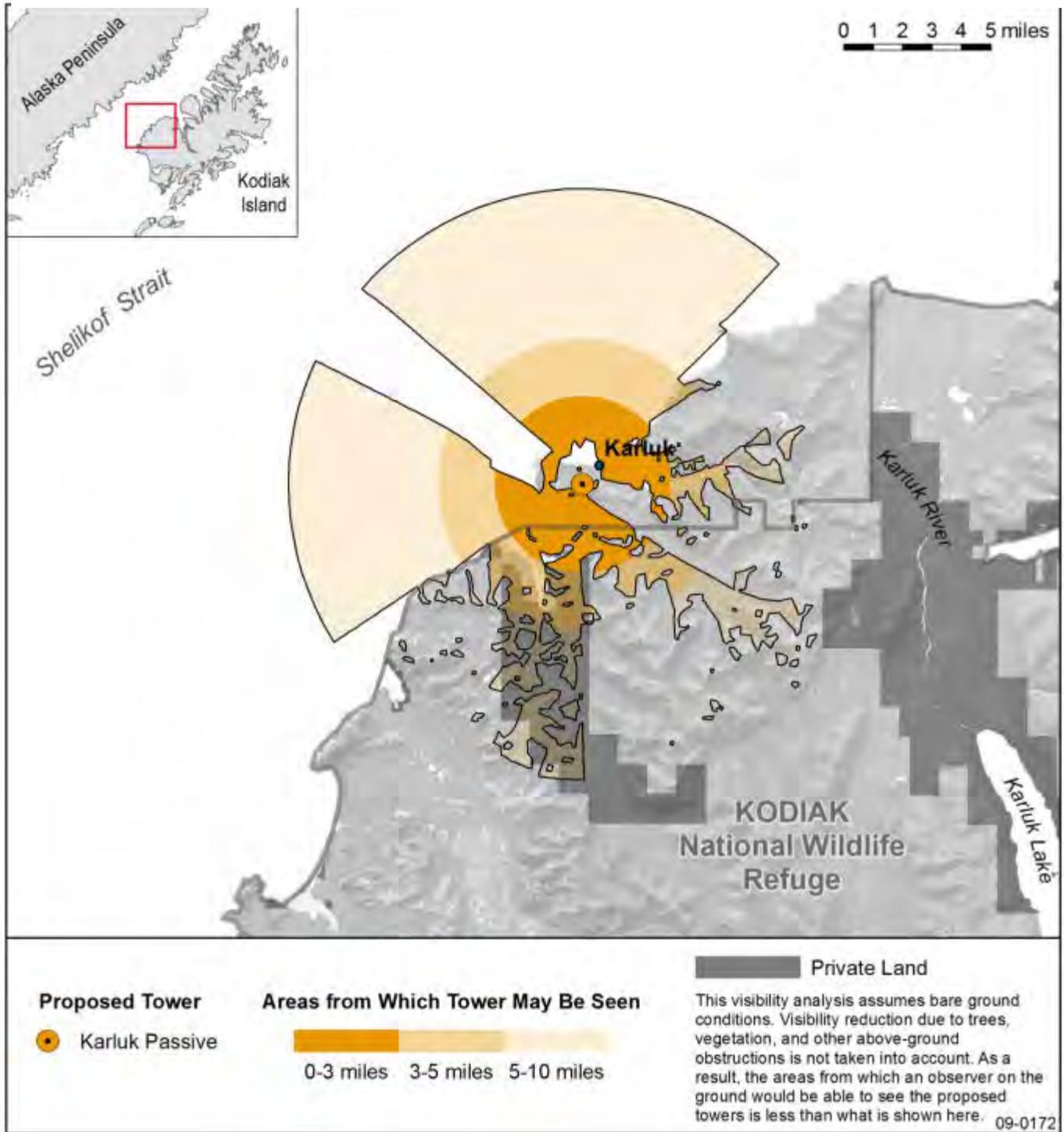


Figure 3 - 13: Locations From Which Larsen Bay Tower would be Visible (off Refuge)

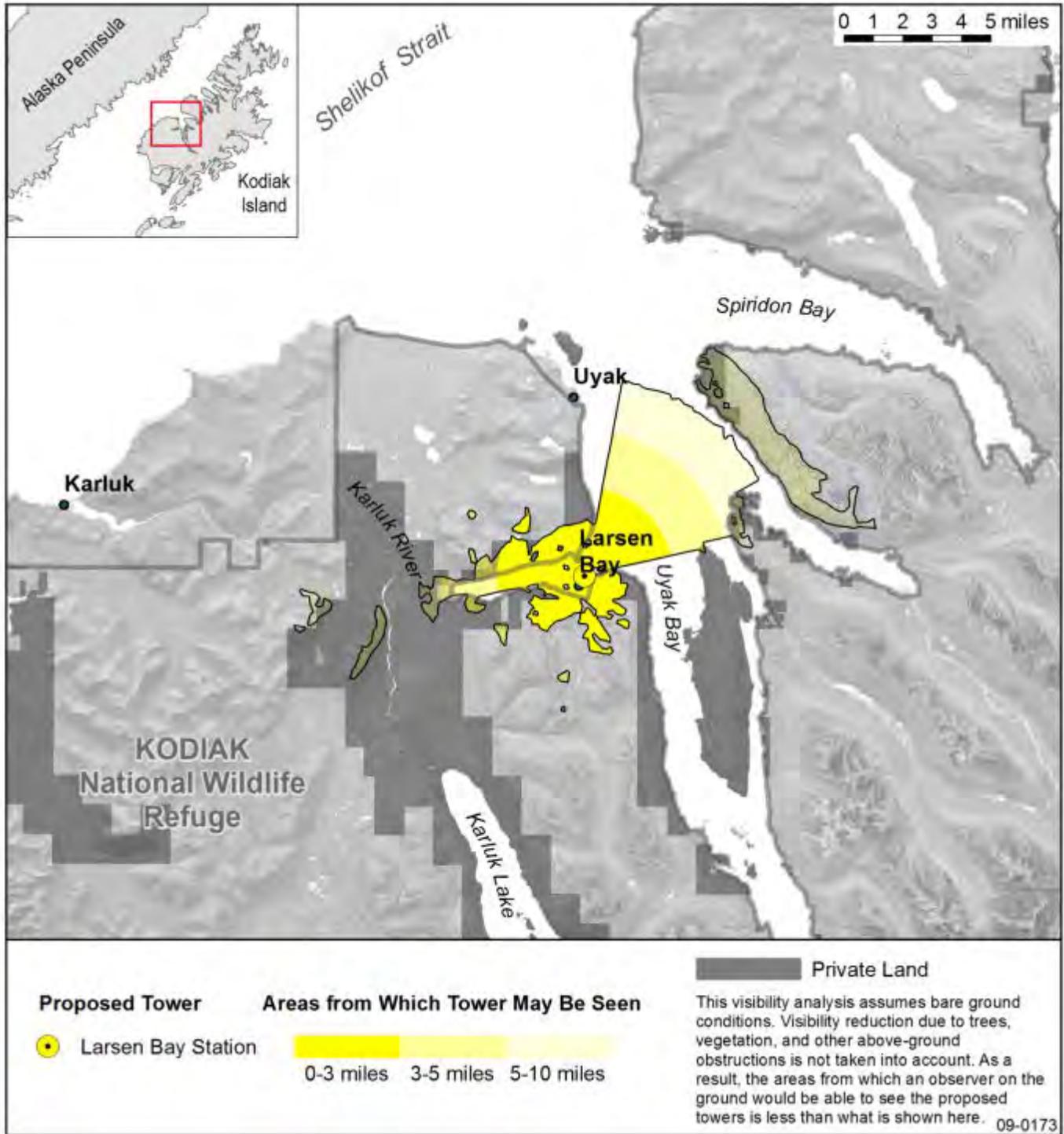


Figure 3 - 14: Locations From Which the Spiridon Tower would be Visible.

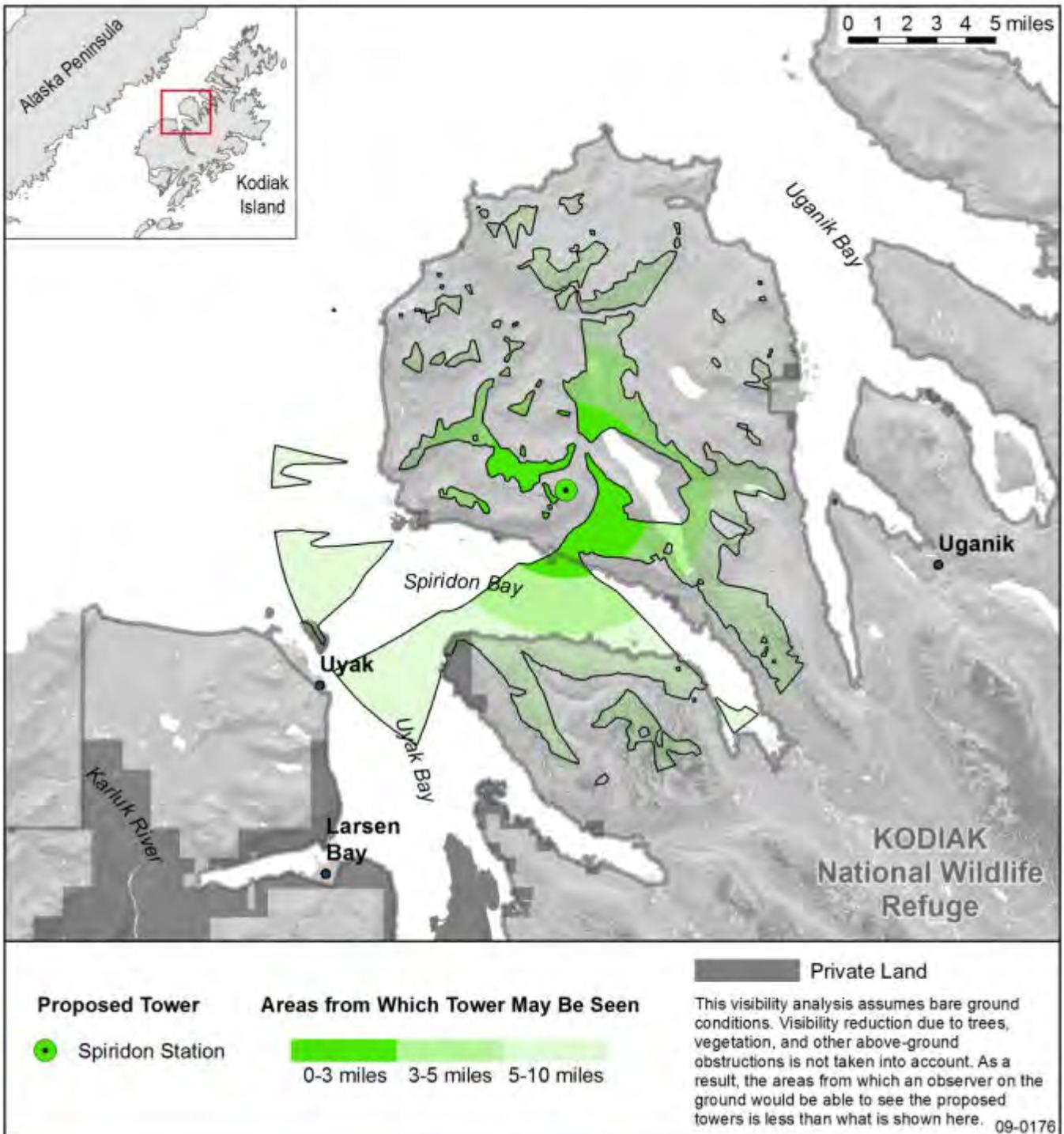


Figure 3 - 15: Locations From Which the Uganik Tower would be Visible.

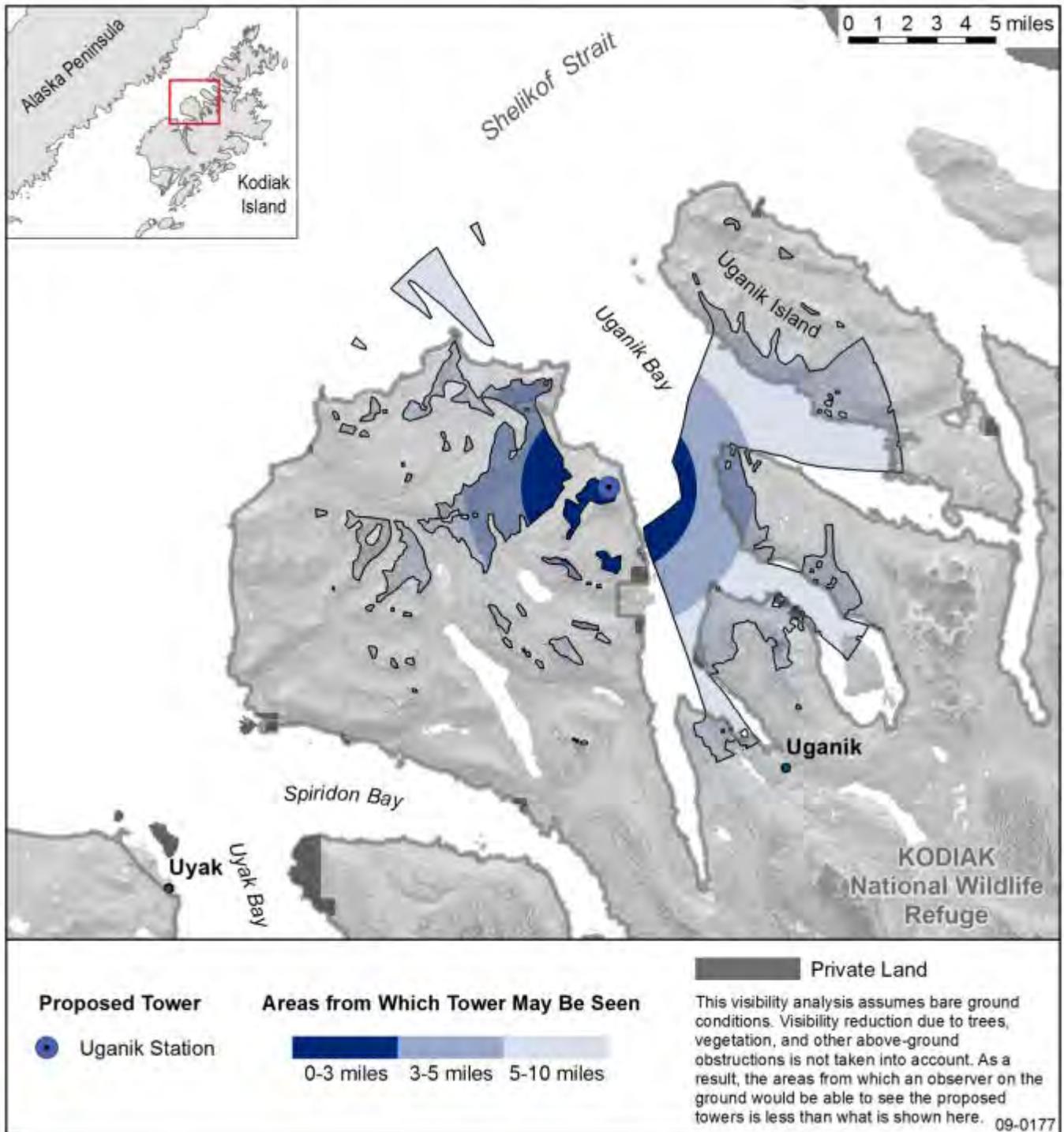
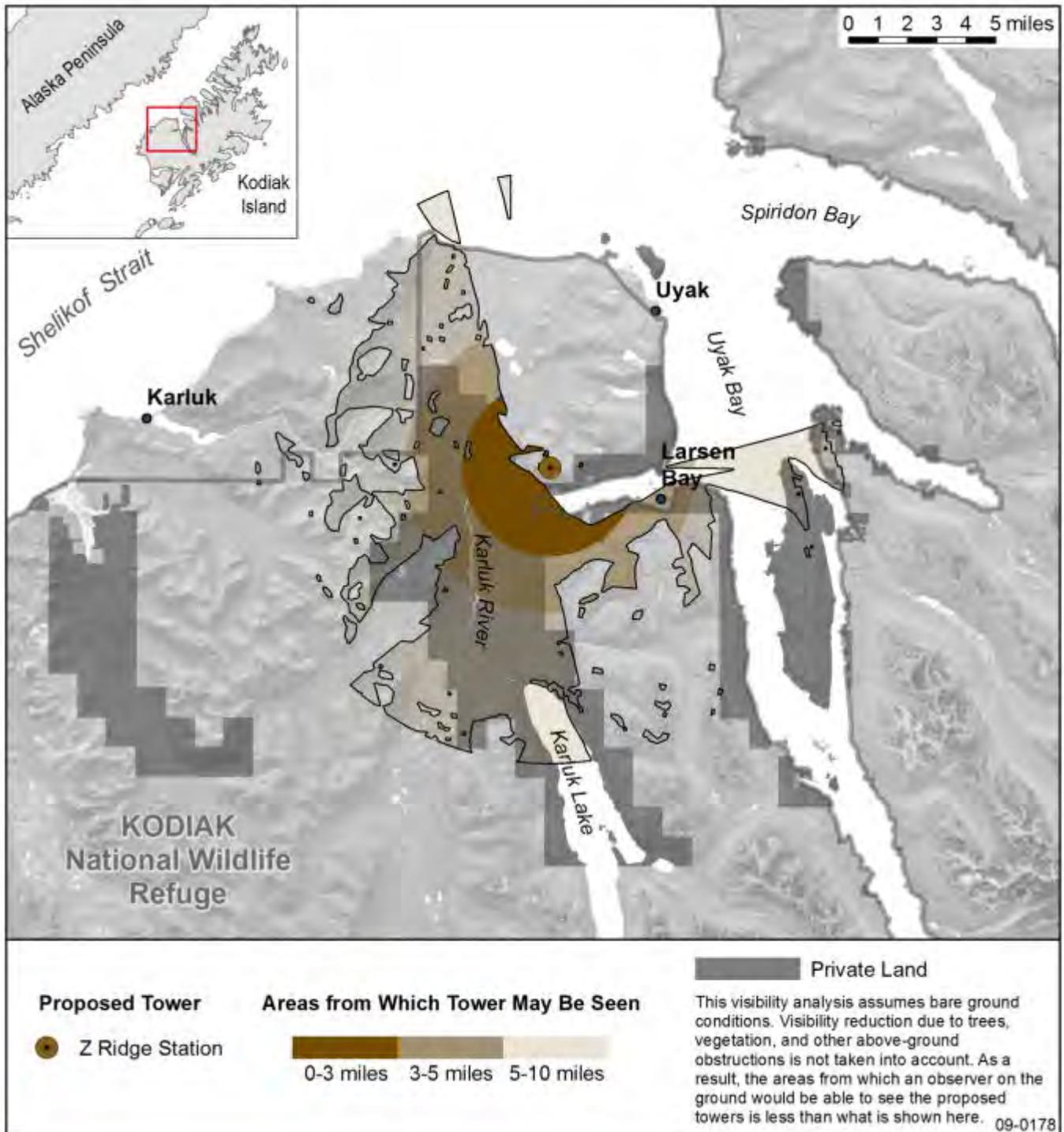


Figure 3 - 16: Locations From Which the Z-Ridge Tower would be Visible.



4 Environmental Consequences

NEPA requires the disclosure of environmental impacts associated with the alternatives including the No Action Alternative. This chapter presents the anticipated environmental impacts of Alternative 1 (No Action) 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.

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.

Long-term Effects – Long-term effects are impacts that would occur throughout the life of the project.

Short-term Effects- Short-term effects are impacts that would occur during only the construction phase of this project.

Cumulative Effects – The Council on Environmental Quality (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 (40 CFR 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 future 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: Descriptions of Final Assessment Categories

Assessment	Description
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 (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 repeater network with four towers to the northeast of the Alternative 3 proposed tower locations. These repeaters are located at Point Lions, Mount Herman, and Mill Bay. They are maintained twice each year and refueled every 18 months via helicopter, a schedule, similar to that proposed for the repeater stations in this project.

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

Proposed microwave repeater 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 would all be located on private lands. The development and maintenance of these sites would be similar to that proposed for Alternative 3.

Removal of Existing Repeaters.

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

4.4 ALTERNATIVE 1 – NO ACTION

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 ALTERNATIVE 3 - AFFECTED RESOURCES – PHYSICAL ENVIRONMENT

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 each site. 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 repeater station 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 microwave repeater stations at Point Lions, Mount Herman, and Mill Bay or the proposed microwave repeater 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 sites, the impacts would be expected to be negligible. Impacts to soils associated with development of proposed microwave repeater 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 stations. When combined with effects to soils associated with the either alternative's repeater station, 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. Stabilization of disturbed areas during and 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 impacts 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 and the flight lines between the staging areas and the construction sites.

Direct and Indirect Effects: Negligible to moderate long-term effects could happen during the construction phase of the project. Through the limitation on fuels at the construction sites and the use of temporary containment ponds the likelihood of a large fuel spill at any 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, Larsen Bay, and Karluk) is located in a heavily used area where the chance of soils already being contaminated by fuel from the commercial fishing fleet, other equipment, or heating fuel is possible. It is expected that fuels for this project will also be stored in temporary containment ponds at the staging area(s) in order to decrease the likelihood of spills and contamination to those areas. The activities associated with this project would pose 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 repeater station towers may become contaminated.

Mitigation: Fuel storage, cleanup, and spill reporting will be conducted in accordance with Service policies. Absorbent material in sufficient quantity to handle 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 to ensure funding is available for any necessary contaminant clean-up.

4.6 ALTERNATIVE 3 - AFFECTED RESOURCES – BIOLOGICAL ENVIRONMENT

4.6.1 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 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. 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. Approximately 0.33 acres of permanent disturbance would occur at each site to accommodate structures. Trampling or crushing of vegetation could occur during construction resulting in damage to plants in the construction zone or helicopter landing area. Some mortality to 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 repeater station 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, Karluk and Village Island staging areas would 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 repeater station 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 repeater station sites. Invasive plants could be introduced in the form of seeds or plants transported on construction equipment or supplies, or on helicopters transporting equipment or supplies 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 microwave repeater station sites at Point Lions, Mount Herman and Mill Bay, and the proposed stations at Pillar Mountain, Elbow Mountain, Larsen Bay, Karluk Bay, and Karluk Passive. Past impacts to vegetation associated with the existing sites would be expected to have been negligible due to the small footprints of the structures. When combined with potential effects to vegetation associated with the sites, the impacts would be expected to be negligible to minor. Impacts to vegetation associated with development of proposed microwave repeater 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 disturbance associated with development of each station. When combined with effects to vegetation associated with these 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 occur in locations devoid of vegetation where possible. Construction equipment, supplies, and helicopters would be inspected prior to transport to the microwave repeater station sites and cleaned as necessary to minimize potential for the introduction of invasive species. During periodic maintenance visits, sites 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.

4.6.2 Biological Environment –Nesting Habitat for Surfbirds, Marbled Murrelets, and Seabirds

The level of impacts 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 and around the Village Islands and the Uganik Peninsula.

4.6.2.1 Surfbirds and Marbled Murrelets

Direct and Indirect Impacts: Minor, direct and indirect short-term effects and minor, direct long-term adverse effects are anticipated to surfbirds and marbled murrelets at the Uganik site. 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 term, by requiring that annual maintenance and refueling avoid the surfbird nesting season this disturbance may be avoided. However, the addition of towers may provide avian predators with perches from which to hunt surfbird and marbled murrelet chicks. Other nesting sites in the area may also be affected due to the noise and number of helicopter flights to and from the 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 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 requiring that annual maintenance and refueling avoid 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 and marbled murrelet nesting season.

4.6.2.2 Seabirds

Direct and Indirect Impacts: Minor to moderate, indirect short-term adverse effects are anticipated to seabirds at the colonies near the 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 repeater stations at Spiridon and Uganik an estimated 140 helicopter flights will be taking off and landing from the Village Islands. Helicopter flights would be restricted to the interior of the Spiridon Peninsula to minimize the effects on seabirds and marine mammals in the area. By restricting flights to areas outside a ½ mile no fly zone from seabird colonies, keeping flights above 2000 feet AGL, and restricting flights to the interior of the peninsula 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 AGL 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 feet AGL. The 2000' AGL is based on FAA Advisory Circular 91-36C, "Visual Flight Rules (VFR) Flight Near Noise-Sensitive Areas."

4.6.3 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 operations implementing the proposed alternative. 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 under the flight paths between these areas. As noted in Section 3.3.1, brown bears routinely transit through these sites. Den sites are also expected to occur near any of the proposed tower sites. The proposed sites 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.

Helicopter overflights are planned to occur at an elevation of approximately 2,000 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 feet 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 denned bears concurrent with passage of fixed-wing aircraft flying at 1,640 – 2,297 feet elevation AGL and den sites. Schoen et al. (1987) and Smith and Van Daele (1990) documented movement of denned 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 feet) 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. Human waste and foods are to be secured 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 repeater station sites at Point Lions, Mount Herman, and Mill Bay and the proposed microwave repeater 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 above 2,000 feet AGL as much as possible, and scheduling construction activities to occur between July 1 and October 24 and maintenance and refueling to occur between December 1 and February 28 or August 1 and October 24 so as to not disturb denning brown bears or bear hunters.

4.6.4 Marine Mammals (Steller's sea lions and sea otters)

Direct and Indirect Impacts: Minor, indirect short-term adverse effects are anticipated to Steller's sea lions in haul-outs at Noisy Islands and Bird Rocks due to multiple helicopter flights coming and going from the 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 transport of construction supplies and the multiple helicopter flights to and from the staging area to the Uganik and Spiridon sites.

Cumulative Impacts: Negligible to minor, indirect short term adverse effects are anticipated. The area around the Village Islands is heavily used by commercial fishing boats and is occupied by numerous set net sites and a cannery. 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 lions or sea otters from the development of Point Lions, Mount Herman, Mill Bay, Pillar Mountain, or Elbow Mountain. By restricting refueling barges and flights from an area three (3) nautical miles 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 when possible. Helicopter flights during construction, maintenance, and refueling, at either the Spiridon or Uganik sites, will be limited to the interior of the Spiridon Peninsula and at least three (3) nautical miles from sea lion haul-outs otherwise. Flights will maintain a minimum altitude of 2000 feet AGL except during takeoffs and landings.

4.7 Alternative 3 - Affected Resources – Social Environment

4.7.1 Social Environment – Cultural Resources

There are no expected effects to historic properties within the areas of the repeater stations or within the staging areas as long as the ground is not disturbed.

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.

4.7.2 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 would be expected.

Construction and operation of the microwave repeater stations 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 repeater stations 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 telecommunications services in these communities, its utility is limited as it often operates at a slow speed, with frequent delays in connectivity, and low reliability. 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 repeater towers 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.

4.7.3 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 of developing the proposed microwave repeater project. The project 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 educational 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 this project and the existing microwave repeaters 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 Repeater 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. Impacts associated with Environmental Justice would be expected to be beneficial.

4.7.4 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 G.

Direct and Indirect Effects: No impacts to subsistence uses are expected. Implementation of the project 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 or resources are expected to occur.

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

4.7.5 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 this alternative, though this route would not be consistent with the Refuge's Comprehensive Conservation Plan (CCP) guidance because the stations 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 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 repeater stations. The change to Moderate Management would allow impacts to the naturalness of the areas and 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 3-7 to 3-13). Habitats could be disturbed and their ability to function through natural processes might be impaired.

Specifically, direct, minor adverse effects would include: 1) long-term removal of 0.33 acres of land from public access within the Refuge for each repeater station site for the life of the project and 2) significant helicopter traffic during the construction season, which though 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 a significant number of helicopter flights each time the stations are refueled, estimated to be every 18 months. Refueling would require approximately 20 round trips for each station in a single day. Although there are already multiple flights in the area on any given day, 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. Additionally, each repeater station would require two maintenance visits each year. Each of these would require only a single round trip helicopter flight and would have negligible adverse effects given the number of other aircraft activities in the area.

Cumulative Effects: Implementation of the proposed alternative would increase the total effect on regional land use (due to additional helicopter use) and acreage disturbed in association with communication systems within the Kodiak Refuge. The unrelated project of removing existing radio repeaters that are no longer in use would contribute a small decrease in cumulative effects.

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

4.7.6 Social Environment – Recreation

Direct and Indirect Impacts: Moderate, direct, short-term effects to public recreational users 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 be visible from much of the area around the Spiridon Peninsula, and Uganik, Spiridon, and Uyak Bays. As described in Section 3.3.7, users to this area are particularly sensitive to changes in the viewshed. It should also be noted, that the towers are 50 feet tall unlighted, neutral-colored lattice towers and may occasionally be shrouded by cloud cover. The antennas on the towers will be relatively large, which may make them more visible. Individuals who use the Uganik Island cabin may be affected the most, because the Uganik tower will be directly across Uganik Bay and possibly visible. As a result, use at this cabin may decline.

Cumulative Impacts: The existing repeater stations at Point Lions, Mount Herman, and Mill Bay, and the proposed microwaverpeater 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 project area. Implementation of this alternative would cause considerable activity during construction in the short-term around Larsen Bay, Karluk, and the 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 number of communication system facilities within the Kodiak Refuge but this would not change the impact to recreationists. Some recreational users place particular value on the undeveloped character of the landscapes 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 be scheduled to occur from December 1 to February 28 or August 1 to October 24 to avoid the most intensive hunting, fishing, and recreational activity periods.

4.7.7 Social Environment – Noise/Soundscape

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

Effects During Construction

The helicopter flights for the 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 or R-44 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 dBA and the expected perceived noise level for a Robinson R-66 is 81 dBA (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 construction 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 or R-44 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 repeater station sites at an altitude of approximately 2,000 ft above ground level or higher.

Noise from construction of the microwave repeater stations would involve portable gasoline-powered equipment, voices, and a variety of sounds associated with the construction camp. On-site construction of the repeater stations 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 engine, and a 4-wheel drive 8 cubic foot 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.

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

Noise impacts to wildlife are discussed in Sections 4.6.3 Brown Bears and 4.6.2 Surfbirds, Murrelets, and Seabirds. Overall, impacts to wildlife associated with noise during construction of the microwave repeater stations would be expected to be moderate, direct and indirect, short-term, and adverse.

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

Effects During Operation & Maintenance

The proposed repeater stations would be visited twice per year, to perform operational checks and maintenance, using a Bell Huey 204 or similar helicopter. Refueling of the propane generators every 18 months would require 20 R-66 or R-44 helicopter round trips over a single day for the life of the project (20 years). Although the maximum noise levels during operation, maintenance, and refueling activities would be associated with landings and take offs from the stations, 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 station construction and ongoing maintenance. For the construction of Spiridon, or Uganik stations, an expected 50 helicopter flights over a 2 week period are expected from the Village Islands. The proposed Z-Ridge, Pillar Mountain, Elbow Mountain, Larsen Bay, Karluk Bay, and Karluk Passive stations would be supported from Larsen Bay. The Village Islands (West Point) currently have only 4 commercial flights every 2 weeks during the summer. Recreational aircraft operate from the Village Islands year round. For the life of the project (25 years), each station would have approximately 20 helicopter flights during 1 day every 18 months for refueling. Each station would be visited twice per year, by helicopter, to perform operational checks and maintenance,

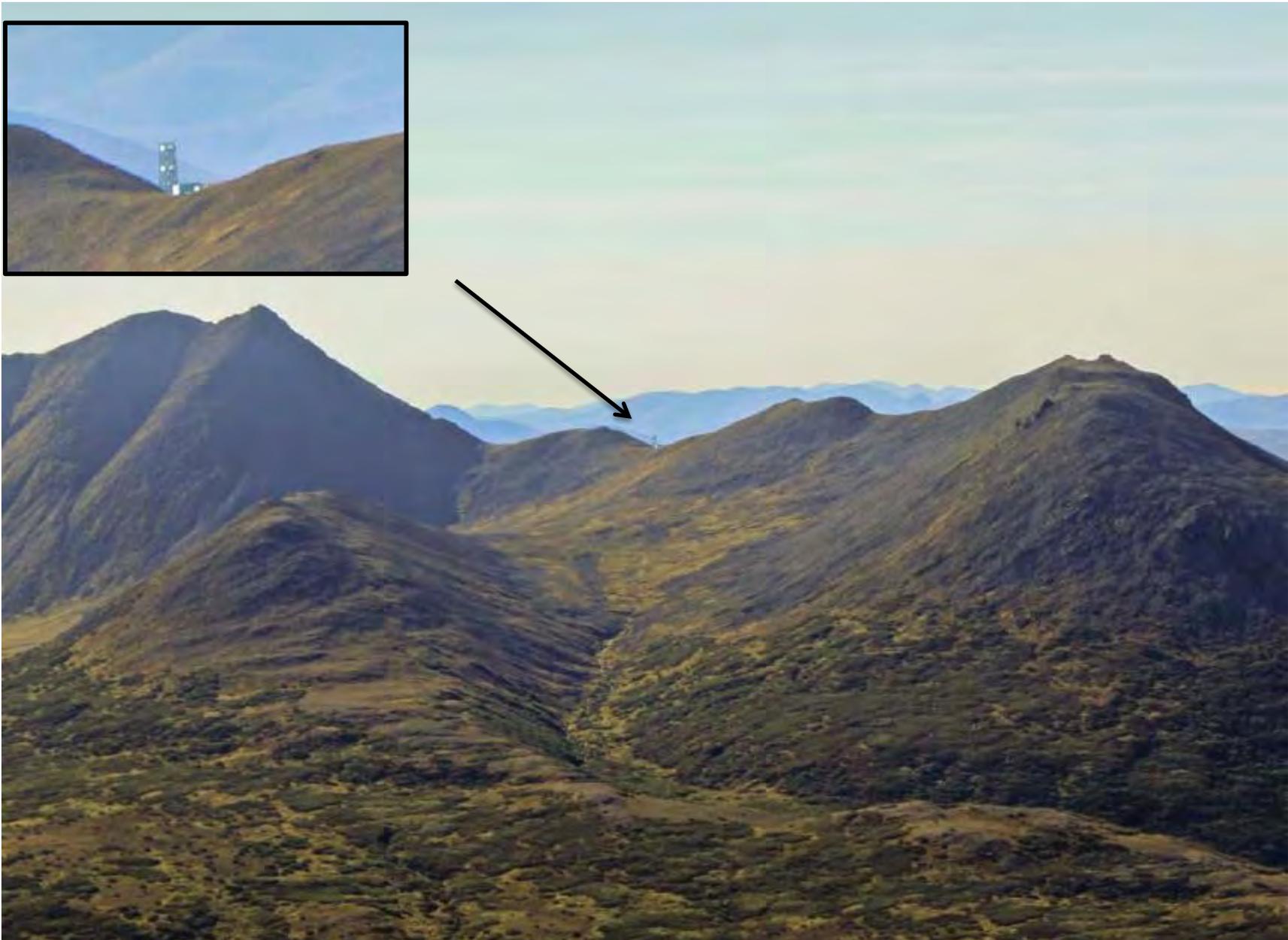
Although the construction flights will not overlap with brown bear denning or recreational bear hunting, they will overlap with seabird nesting season and the summer recreational hiking, fishing, and sight-seeing seasons. Flights associated with the operation and maintenance of the project will occur later in the year to avoid as much of the denning, nesting, and recreational seasons 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 feet AGL. The 2000 foot AGL is based on FAA Advisory Circular 91-36C, "Visual Flight Rules (VFR) Flight Near Noise-Sensitive Areas." Helicopter-supported refueling would be scheduled to occur from December 1 to February 28 or August 1 to October 24 to avoid the most intensive hunting, fishing and recreational activity periods.

4.7.8 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 3-7 to 3-13). 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 this project was not done, the towers are similar to those analyzed in the TERRA Southwest Environmental Assessment prepared for the Service, National Park Service, and Bureau of Land Management in 2011. Figure 4-1 shows a 60 foot 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 microwave repeater tower from 3.3 miles. (Caribou Ridge, TERRA Southwest Project)



Direct and Indirect Effects - Construction: Construction of the proposed repeater stations at Uganik, Spiridon, and Z-Ridge would be expected to result in moderate temporary direct effects to visual resources. The additional flights to construct the station at Z-Ridge would be based out of Larsen Bay, instead of Village Islands. Direct effects would likely result from the intensity of the activity at each site, including increased activity on land and increased air traffic due to 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 towers and associated buildings at the repeater stations 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 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 changes would be expected to be minimized by the scale of the landscape. From Uyak Bay, the Spiridon, Z-Ridge and Larsen Station towers would be visible. From the Spiridon Peninsula, both the Spiridon and Uganik towers would be visible. From some locations on the peninsula only one or the other tower would be visible, and at lower elevations neither may be visible. The 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 microwave project completed on Togiak Refuge in 2011, 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 repeater stations. Such impacts are considered a medium-intensity action, as a change in visual resources would be measurable, and could alter a visitor's experience. It is also important to note that although the towers may change the views, the Uganik repeater station is within 5 miles of the Village Islands, an area with numerous homes, cabins, and a cannery; and the Z-Ridge station is within sight of the community of Larsen Bay. There are no developments near the Spiridon repeater station.

Cumulative Effects:

This proposed project is expected to result in moderate long-term impacts to visual resources in the immediate area, including the Karluk River, and minor long-term impacts to a broader area. The station sites for this project are near to areas already developed (i.e. Village Islands and Larsen Bay), and although they may be seen from areas where there have been no past actions that have altered the visual resources, they will be at such a distance as to make them only slightly noticeable (Figure 4-1). Other repeater stations being developed to complete this network are several miles away and not within sight of these towers, except Larsen Bay Station which is located on private lands just outside the community of Larsen Bay. Another communication tower 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 tan in order to make them blend in to the environment as much as possible.

5 Statement of Environmental Significance of the Proposed Action

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 microwave repeater stations along the route through Uganik, Spiridon, and Z-Ridge sites.

6 Irreversible and Irrecoverable Commitment of Resources

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

This EA was developed in part by two lead firms under separate contracts with Kodiak Microwave Systems, LLC (KMS) a subsidiary of Old Harbor and Ouzinkie Native Corporations. 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 (Service) and additional subcontractors were brought in for specific tasks for the development of this EA. The Service holds final responsibility for all content. Personnel for each contributing party are listed in Table 7-1.

Table 7 - 1: Preparers, Contributors, and Advisors

Contributing Party	Personnel	Title
NMFS	Bridget Crokus	Wildlife Biologist – Protected Resources Division and Habitat Conservation Divisions
NMFS	Barbara Mahoney	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



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; 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



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.

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.

Sincerely,

Anne Marie LaRosa
Refuge Manager, Kodiak National Wildlife Refuge

Appendix C. ESA Section 7 Intra-Agency Consultation

ES Consultation Number: _____

Page 1 of 5



Intra-Service Section 7 Biological Evaluation Form

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

Date Submitted: *June 27, 2016*
Region 7 (Alaska)

- 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 for Spiridon, Uganik, and Z-Ridge microwave repeater stations.*
- IV. **Location:** The lands that the applicant has requested to use under the right-of-way permit application are located on the northeastern side of Kodiak Island, Alaska. See attached map.
- V. **Project Description:** Kodiak Microwave Systems, LLC submitted an application to the Region 7 National Wildlife Refuge, Division of Realty and Conservation Planning requesting a right-of-way permit to construct three 50' free-standing, unlighted, lattice-type, microwave towers at Uganik, Spiridon, and Z-Ridge. As part of the project three additional towers will be constructed on private lands and are not part of the Service's permitting process. They include Larsen Bay, Karluk Passive, and Karluk Bay. All of the towers, regardless of the Service's permitting status, are included in Table 1 and Figure 1.

Table 1. Tower Locations and Elevation

Tower	GPS Location	Elevation (ft)
Uganik	57°49'17.01"N 153°34'59.21"W	1,989
Spiridon	57°43'14.29"N 153°45'48.52"W	2,677
Z-Ridge	57°32'52.20"N 154° 5'14.40"W	2,174
Larsen Bay	57°32'14.52"N 153°58'47.94"W	Unknown
Karluk Passive	57°33'43.66"N 154°28'23.66"W	Unknown
Karluk Bay	57°33'49.41"N 154°26'4.70"W	Unknown

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

Maintenance and Refueling Activities:

Because maintenance flights will be required to be along the interior of Kodiak Island, no effect to sea otters or their habitat is expected from these activities.

Refueling operations will be based either from a barge in Uganik Bay or Uyak Bay or from the ground at one of the staging areas. Overall, we have determined that this project will have no effect on northern sea otters or their 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.

ES Consultation Number: _____

Page 5 of 5

Supervisor at originating station

Printed Name:	<u>Douglas Campbell</u>
Signature:	<u><i>Douglas Campbell</i></u>
Date:	<u>6/22/16</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 Concurrence from National Marine Fisheries Service



UNITED STATES DEPARTMENT OF COMMERCE
National Oceanic Atmospheric Administration
National Marine Fisheries Service
P.O. Box 21668
Juneau, Alaska 99802-1668

June 21, 2016

Mr. Gregory Siekaniec
Regional Director
U.S. Fish and Wildlife Service
1011 East Tudor Road
Anchorage, Alaska 99503

Re: Kodiak National Wildlife Refuge, Right of Way Permit, AKR-2016-9562

Dear Mr. Siekaniec:

National Marine Fisheries Service (NMFS) has completed informal consultation with the U.S. Fish and Wildlife Service (USFWS) under section 7(a)(2) of the Endangered Species Act (ESA) regarding a proposed right-of-way permit within the boundary of the Kodiak National Wildlife Refuge, Kodiak, Alaska.

NMFS received your May 19, 2015 request for written concurrence that the proposed action may affect, but is not likely to adversely affect, the endangered western Distinct Population Segment (wDPS) Steller sea lion (*Eumetopias jubatus*) or Steller sea lion critical habitat. Based on our analysis of the information you provided us and additional literature cited below, NMFS concurs with your determination. A complete administrative record of this consultation is on file in this office.

Consultation History

NMFS received your request for consultation and project specifications on May 19, 2016. NMFS requested clarification and more information about the project and mitigation measures on May 27, 2016. USFWS responded to NMFS with additional information regarding the project and revised the project specifications and mitigation measures on June 1, 2016.

Description of the Proposed Action and Action Area

USFWS proposes to authorize Kodiak Microwave Systems, LLC to install communications equipment to service two communities on Kodiak Island: Karluk and Larsen Bay. Specifically, the applicant requested a right-of-way permit to construct three 15 meter (m) (50 feet [ft.]) free-standing, unlighted, lattice-type, microwave towers, at Uganik, Spiridon, and Z Ridge (Table 1 and Figure 1). The towers will initially support three 2.4-3.0 m (8-10 ft.) microwave dishes, plus a single communication hut with all electronics and generation equipment inside. There will also be up to six 1,893 liter (500 gallon) propane tanks on site. Each leased area will be an approximately 24.4 m (80 ft.) circle (467 square meters [5,024 square feet]).

Alaska Region - www.alaskafisheries.noaa.gov



Table 1. Tower locations and elevations.

TOWER	GLOBAL POSITIONAING SYSTEM LOCATION	ELAIVATION
Uganik	57°49'17.01"N 153°34'59.21"W	606 m (1,989 ft.)
Spiridon	57°43'14.29"N 153°45'48.52"W	816 m (2,677 ft.)
Z-Ridge	57°32'52.20"N 154°05'14.40"W	663 m (2,174 ft.)
Larsen Bay	57°32'14.52"N 153°58'47.94"W	Unknown
Karluk Passive	57°33'43.66"N 154°28'23.66"W	Unknown
Karluk Bay	57°33'49.41"N 154°26'04.70"W	Unknown

Three additional towers will be constructed on private lands and are not part of USFWS permitting process. They include Larsen Bay, Karluk Passive, and Karluk Bay (Table 1 and Figure 1).

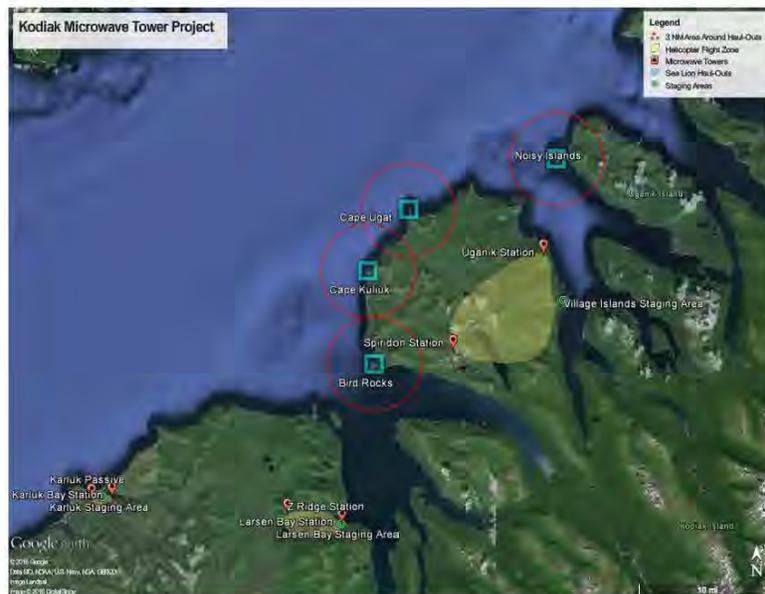


Figure 1. Project area, helicopter flight zones, and known Steller sea lion haulout areas.

Construction for Uganik and Spiridon sites will be staged from private land in the Village Islands, an area with numerous homesteads, set net sites, cannery, and other commercial fishing activities. The construction of Z-Ridge will be staged from the community of Larsen Bay.

A barge will deliver equipment and materials to the staging sites from Anchorage, Alaska, or Seattle, Washington. Helicopters will then transport equipment, materials, and personnel to the construction sites. The barge is expected to travel at approximately 8 nautical miles (nm) (5 miles) per hour and is required to stay at least 3 nm (1.9 miles) from the Steller sea lion haulouts.

Helicopters will fly at least 610 m (2,000 ft.) above ground level, at least 3 nm (1.9 miles) from sea lion haulouts, and use inland approaches to construction sites. Construction is expected to begin in July and end in late August.

Long Term Maintenance and Refueling

The towers are expected to be located on the Refuge for 25 years. During the life of the project, maintenance trips will occur twice annually with a single helicopter moving from one site to the next, starting at and returning to the City of Kodiak in a single day, if possible. Refueling will occur from a barge located in Uganik Bay or Uyak Bay, with 20 helicopter (R-66) trips to each site to replace propane tanks at least every 18 months. Maintenance and refueling trips are limited to December 1 to February 28 or August 1 to October 24, to avoid nesting shorebirds and seabirds, and denning bears.

Action Area

The three microwave tower sites to be permitted by USFWS are located on the west side of Kodiak Island on Spiridon Peninsula and above the community of Larsen Bay (Figure 1).

The action area is defined in the ESA regulations (50 CFR 402.02) as the area within which all the project's direct and indirect effects will occur. The action area is distinct from and larger than the project footprint because some elements of the project may affect listed species some distance from the project footprint. The action area, therefore, extends out to a point where no measurable effects from the project are expected to occur.

Since 1997 NMFS has used generic sound exposure thresholds to determine whether an activity produces sound that might result in impacts to marine mammals (70 FR 1871). NMFS is currently developing comprehensive guidance on sound levels likely to cause injury and behavioral disruption to marine mammals. However, until such guidance is available, NMFS uses the following conservative thresholds for underwater and in air sound pressure levels (SPL)¹, expressed in root mean square (rms)², from broadband sounds that cause behavioral disturbance; and referred to as Level B harassment under section 3(18)(A)(ii) of the Marine Mammal Protection Act (MMPA):

- Underwater impulsive sound: 160 decibel (dB) re 1 microPascal (μPa)_{rms}
- Underwater non-impulsive sound: 120 dB re 1 μPa _{rms}
- In-air generic sound: 100 dBA re 20 μPa

The action area will include the area where Steller sea lions: 1) may be subjected to project-related sound levels greater than background levels, equal to or greater than 120 dB re 1 μPa _{rms} during activities that produce non-impulsive sound underwater; and 2) may be subjected to project-related sound levels equal to or greater than 100 dB re 20 μPa during activities that produce non-impulsive sound in-air.

¹ Sound pressure is the sound force per unit microPascal (μPa), where 1 pascal (Pa) is the pressure resulting from a force of one newton exerted over an area of one square meter. Sound pressure level is expressed as the ratio of a measured sound pressure and a reference level. The commonly used reference pressure level in acoustics is 1 μPa , and the units for underwater sound pressure levels are decibels (dB) re 1 μPa .

² Root mean square (rms) is the square root of the arithmetic average of the squared instantaneous pressure values.

The Uganik construction site is approximately 10 kilometer (km) (6 miles) away from a Steller sea lion haulout located at Noisy Islands. The Spiridon construction site is approximately 10 km (6 miles) away from a haulout located on Bird Rocks. The Z-Ridge construction site is approximately 16 km (10 miles) from the Bird Rocks haulout. Uganik and Uyak bays are adjacent to Shelikof Straits.

Mitigation Measures

Due to concerns regarding the effects of the in-air (helicopter) and in-water (barge) traffic on wDPS Steller sea lions and sea lion critical habitat, and other marine mammals, the USFWS provided the following mitigation and monitoring measures:

- 1) All barges will remain at least 3 nm (1.9 miles) from nearby Steller sea lion haulouts.
 - a. When the barge enters and leaves Uganik Bay, it will need to traverse within the 3 nm (1.9 miles) exclusion zone because the entire mouth of Uganik Bay is within 3 nm (1.9 miles) of the Noisy Islands haulout. Given that the barge will travel within 3 nm (1.9 miles) proximity to the Noisy Islands haulout, the barge will travel as far distant from the haulout as safely possible.
- 2) Helicopter traffic will be limited to the interior of Spiridon Peninsula to avoid disturbing the coastal Steller sea lion haulout areas (Figure 1).
 - a. Helicopter flight lines will stay at least 610 m (2,000 ft.) above ground level
 - b. Helicopter flight lines will stay at least 3 nm (1.9 miles) from the sea lion haulouts

Listed Species and Critical Habitat

WDPS Steller Sea Lions

Steller sea lions were listed as a threatened species under the ESA on November 26, 1990 (55 FR 49204). In 1997, NMFS reclassified Steller sea lions as two DPSs based on genetic studies and other information (62 FR 24345); at that time the eastern DPS (eDPS) was listed as threatened and the wDPS was listed as endangered. On November 4, 2013, the eDPS was removed from the endangered species list (78 FR 66139). Information on Steller sea lion biology and habitat (including critical habitat) is available at:

<http://alaskafisheries.noaa.gov/protectedresources/stellers/default.htm>, and
http://www.nmfs.noaa.gov/pr/sars/pdf/alaska2014_final.pdf.

WDPS Steller sea lions may be present around the project area, Spiridon Peninsula, Uganik Bay, and Uyak Bay for the following reasons:

- Four Steller sea lion haulout locations are in the vicinity (Table 2):
 - Bird Rock, Cape Kuluk, Cape Ugat, and Noisy Islands
- Steller sea lions are highly mobile and have large ranges.
 - Potential prey sources exist seasonally near the project area, and during these times sea lions likely spend more time near salmon streams.

The ability to detect sound and communicate underwater is important for a variety of Steller sea lion life functions, including reproduction and predator avoidance. Steller sea lions have similar hearing thresholds in-air and underwater as other otariids. In-air hearing ranges from 0.250-30

kHz, with their best hearing sensitivity at 5-14.1 kHz (Muslow and Reichmuth 2010). An underwater audiogram shows the typical mammalian U-shape. Higher hearing thresholds, indicating poorer sensitivity, were observed for signals below 16 kHz and above 25 kHz (Kastelein et al. 2005).

Table 2. Steller sea lion haulouts and abundance counts (NMFS AFSC, unpublished).

YEAR	BIRD ROCK		CAPE KULIUK		CAPE UGAT		NOISY ISLANDS	
	Surveys	Count*	Surveys	Count*	Surveys	Count*	Surveys	Count*
JUNE								
2006	0	-	1	0	1	167	1	0
2007	0	-	1	0	4	253	1	0
2008	0	-	1	0	4	286	0	-
2009	0	-	0	-	4	272	1	0
2010	2	108	1	0	4	140	1	0
2011	0	-	0	-	4	212	1	0
2013	1	28	1	0	4	222	1	0
JULY								
2015	1	0	1	0	4	153	1	0

***Largest daily abundance for that month**

Steller Sea Lion Critical Habitat

NMFS designated critical habitat for Steller sea lions on August 27, 1993 (58 FR 45269). In Alaska, designated critical habitat includes: 1) a 37 km (23 mi) seaward buffer around all major haulouts and rookeries west of 144° W longitude; 2) 900 m (3,000 ft.) terrestrial, air, and aquatic zones around major haulouts and rookeries east of 144° W longitude, and 3) three special aquatic foraging areas: Shelikof Strait, Bogoslof, and Seguam Pass areas (Figure 2). The Shelikof Strait area in the Gulf of Alaska and consists of the area between the Alaska Peninsula and Tugidak, Sitkinak, Aiaktalik, Kodiak, Raspberry, Afognak, and Shuyak islands (connected by the shortest lines); bounded on the west by a line connecting Cape Kumlik (56°38' N/157°27' W) and the southwestern tip of Tugidak Island (56°24' N/154°41' W) and bounded in the east by a line connecting Cape Douglas (58°51' N/153°15' W) and the northernmost tip of Shuyak Island (58°37' N/152°22' W). The project area is within Steller sea lion critical habitat.

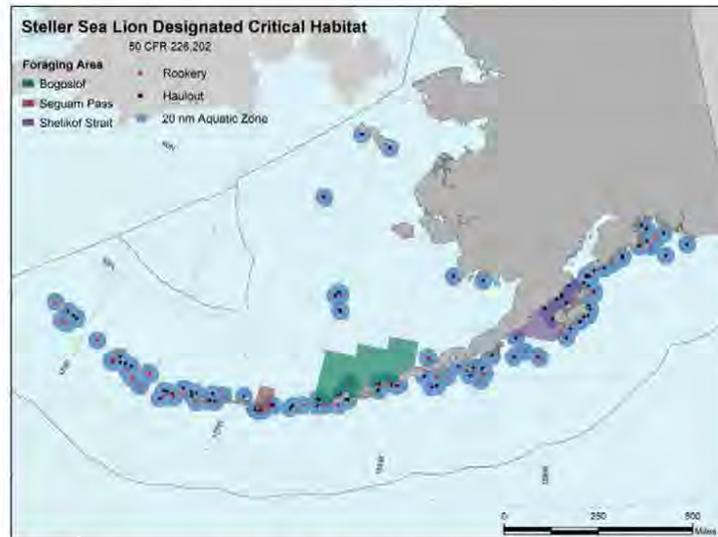


Figure 2. Designated critical habitat for Steller sea lions.

Effects of the Action

For purposes of the ESA, “effects of the action” means the direct and indirect effects of an action on the listed species or critical habitat, together with the effects of other activities that are interrelated or interdependent with that action (50 CFR 402.02). The applicable standard to find that a proposed action is “not likely to adversely affect” listed species or critical habitat is that all effects from the action are expected to be insignificant, discountable, or completely beneficial. Insignificant effects relate to the size of the impact and are those that one would not be able to meaningfully measure, detect, or evaluate, and should never reach the scale where take occurs. Discountable effects are those that are extremely unlikely to occur. Beneficial effects are contemporaneous positive effects without any adverse effects to the species.

The potential effects of the proposed action on listed species and critical habitat include acoustic disturbance (noise) and habitat alteration.

Noise

The ability to hear and transmit sounds is vital to marine mammal survival. Marine mammals use sound to gather information about their environment, communicate, and detect prey and predators. Possible impacts to marine mammals exposed to loud sounds include disturbance and injury. Disturbance can range from mild (e.g., heads-up display, increased vocalizations) to severe (e.g., abandonment of vital habitat). The distances that aircraft and vessel noise is audible to the sea lions will depend upon the source levels, frequency, environmental propagation characteristics, ambient noise levels, and receptor sensitivity (Richardson et al. 1995).

Anthropogenic noises in the action area include helicopters and barges. The effects from human caused noise on Steller sea lions depend on several factors, including: the noise's intensity, frequency, and duration; the animal's location and behavior; and the ambient acoustic environment. High frequency noise generally attenuates more rapidly than low frequency noise. Underwater sound also propagates less efficiently in shallow waters and over soft bottoms (sand and mud). The haulout areas are characterized by relatively shallow depth, with strong winds and currents; thereby making it a relatively poor environment for in-air and underwater acoustic propagation.

Noise from Aircraft

Aircraft noise is not likely to result in Level B take of Steller sea lions because the known haulouts in the action area are sufficiently distant and shielded by terrain. To ensure that airborne noise from this activity does not result in takes of Steller sea lions, the helicopter flight lines will stay at least 610 m (2,000 ft.) above ground level, stay at least 3 nm (1.9 miles) from the sea lion haulouts, and use inland approaches (Figure 1). Therefore, we do not expect that helicopter noise will exceed 100 dBA re 20 μ Pa sound threshold for Level B take for the Steller sea lions. NMFS concludes that effects from airborne noise from helicopters are extremely unlikely to result in the take of Steller sea lions, and, as a result, are insignificant.

Noise from Vessels

Vessel noise associated with barge delivery will be transmitted in-air and through water, and constitutes a continuous noise source (versus an impulse noise). Marine mammal responses to vessels are generally associated with the noise (in-air and in-water), and depend on changes in the engine and propeller speed (Richardson et al. 1995). Visual cues may also contribute to marine mammals' reactions to nearby vessels (Richardson et al. 1995).

In-air and in-water noise from the tug and barge would be audible to Steller sea lions, but would occur at very low frequencies. We expect the noise will not be sufficiently loud to disturb the sea lions at their haulouts because the in-air acoustic output will be below Level B acoustic threshold of 100 dBA re 20 μ Pa within 15 m (50 ft.) (Table 3). While Steller sea lions could be exposed to Level B acoustic harassment if they approach within 15 m (50 ft.) of vessels at full volume operation, we expect the visual disturbance created by the boats will prevent such a close approach. In addition, boat operator best practices described in the mitigation measures for this project will further reduce the potential for Steller sea lion/vessel encounters that are sufficiently close to cause Level B acoustic harassment.

Table 3. Sound levels for boats that may be similar to barges planned at Uganik Bay (Epsilon 2006).

SOUND SOURCE	REFERENCE SOUND LEVEL	REFERENCE DISTANT	DATA SOURCE	COMMENT
Tug Boat	87 dBA	15 m (50 ft.)	Port of Oakland FEIS	Assumes 900-1,000 horsepower (hp)
Work Boat	72 dBA	15 m (50 ft.)	7.6 m (25 ft.) long twin screw tugboat measured at the Island End River site while moving a barge	Tender tug
Survey Boat	81 dBA	15 m (50 ft.)	New Jersey State Police Marine Division 1995	Police patrol boat, single 175 hp Johnson outboard engine at full throttle

We do not anticipate that this project will expose wDPS Steller sea lions to sound exceeding Level B acoustic thresholds because: 1) the project incorporates exclusion zones (3 nm [1.9 miles]) and additional mitigation measures that minimize the risk of noise exposure; 2) Cape Ugat, which is the dominant sea lion haulout in the area (Table 2), is well away from the project activities; and 3) it appears the sea lion abundance numbers closest to the Uganik site would be low given the known use of Noisy Islands (Table 2). We conclude that Steller sea lions are not likely to be exposed to sounds sufficient to cause observable effects and the projects mitigation measures will make exposure to sound in excess of Level B MMPA take thresholds extremely unlikely. Therefore, we conclude such effects are insignificant.

Steller Sea Lion Critical Habitat

NMFS identified physical and biological features essential for conservation of Steller sea lions in the final rule to designate critical habitat (58 FR 45269; August 27, 1993), including terrestrial habitat, aquatic habitat, rafting sites, food resources, and foraging habitat. The proposed project will not impact terrestrial habitats due to its distance from the nearest terrestrial haulout about 10 -16 km (6-10 miles) away by air. No sea lion rafting sites are known to occur in this region; therefore, none will be affected.

The proposed project has the potential to impact sea lion aquatic habitat and displace their prey species, which would potentially affect foraging habitat. Effects to prey are expected to be limited to within a few meters (few ft.) of the barge, the distance at which particle motion adversely affects salmon smolt. The small number of prey fish that may be affected by this project will have no measurable effect on overall prey availability in the area. Therefore, any effects on the essential physical or biological features comprising Steller sea lion critical habitat are expected to be discountable.

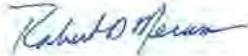
Conclusion

Based on this analysis, NMFS concurs with your determination that the proposed action may affect, but is not likely to adversely affect, the wDPS Steller sea lion or Steller sea lion critical habitat.

Reinitiation of consultation is required where discretionary federal involvement or control over the action has been retained or is authorized by law and if: 1) take of listed species occurs, 2) new information reveals effects of the action that may affect listed species or critical habitat in a manner or to an extent not previously considered, 3) the action is subsequently modified in a manner that causes an effect to the listed species or critical habitat that was not considered in this concurrence letter, or 4) a new species is listed or critical habitat designated that may be affected by the identified action (50 CFR 402.16).

Please direct any questions regarding this letter to Barbara Mahoney at (907) 271-3448 or barbara.mahoney@noaa.gov.

Sincerely,


for James W. Balsiger, Ph.D.
Administrator, Alaska Region

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Appendix E. Compatibility Determination

COMPATIBILITY DETERMINATION

Use: Rights-Of-Way for Remote Microwave Repeater Installation at Uganik, Spiridon, and Z-Ridge Sites

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 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).

Wildlife most likely to be affected includes surfbirds, marbled murrelets, and seabirds which nest in the vicinity of the tower sites and brown bear which den and forage in these areas. Steller's sea lions and sea otters which forage in the marine waters near the staging areas may be affected, but are not likely to be adversely affected. Vegetation will be removed from 1/3 of an acre at each tower site. In order to mitigate effects, the construction season is limited to July 1 to October 24 and maintenance activities will be limited to December 1 and February 28 or August 1 to October 24 with helicopter flights for construction and maintenance being limited to inland routes. No barge traffic or helicopter flights are allowed within 3 nautical miles of Steller's sea lion haul-outs at Noisy Islands, Bird Rocks, Cape Ugat or Cape Kuliuk.

The installations on Uganik, Spiridon, and Z-Ridge 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 108 cubic ft of soil displaced over 3 sites and on each site approximately 0.33 acres would be disturbed.
Vegetation	Minor, long-term adverse impacts to vegetation are expected. 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	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 in the long-term.
Surfbird (<i>Calidris virgate</i>)	Minor, short-term, direct during construction and minor, long-term, indirect effects through the life of the projects are expected to nesting habitat at Uganik site. There are no expected affects 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.

	Peninsula and would occur for a short duration (1 day) 2-3 times per year for maintenance and refueling.
Visual Resources	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.

Public Review and Comment:

In May 2016, the original compatibility determination for the Rights-Of-Way for Remote Microwave Repeater Installations on Kodiak Refuge was released to the public via an ad in the Kodiak Daily Mirror and through the Refuge’s social media website giving a link to an electronic version on the Refuge’s website. In addition, hard copies were placed at the Refuge Visitor Center, the City of Kodiak library, and the Kodiak Community College library. Email copies were sent to all local tribes, native corporations, and refuge big game guide permit holders. No comments were received.

In June 2016, a revised compatibility determination for this use was released changing the location of the project from Midridge and Larsen Peak to Uganik, Spiridon, and Z-Ridge. The public was notified via social media that an electronic copy was available on the Refuge’s website and hard copies were placed at the Refuge Visitor Center, the City of Kodiak Library, and the Kodiak Community College library. Email copies were again sent to all local tribes, native corporations, and refuge big game guide permit holders. No comments were received.

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

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.

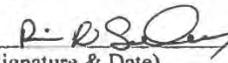
Continuance of Operations

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 .

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.

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.

Signature Refuge Manager:  6/29/16
(Signature & Date)

Concurrence Regional Chief: *pting*  6/29/2016
(Signature & Date)

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.

NEPA Compliance for Refuge Use Decision:

- Categorical Exclusion without Environmental Action Memorandum
- Categorical Exclusion and Environmental Action Memorandum
- Environmental Assessment and Finding of No Significant Impact
- Environmental Impact Statement and Record of Decision

Appendix F. Right-of-Way Stipulations



THE SECRETARY OF THE INTERIOR, through her authorized representative, the Chief, Division of Realty and Conservation Planning, Region 7, U.S. Fish and Wildlife Service, hereinafter referred to as the "Service", in accordance with 16 U.S.C. § 668dd (d), 50 C.F.R. § 29.21 16 U.S.C. §§ 3161-3173, and 43 C.F.R. § 36, does hereby grant a Right of Way Permit (Permit) to the Kodiak Microwave System, LLC, hereinafter referred to as "Permittee", to use and occupy certain lands located within the Kodiak National Wildlife Refuge in Alaska, hereinafter referred to as "the Refuge".

RIGHT-OF-WAY AUTHORIZATION

The Permit authorizes the Permittee to construct, operate, and maintain single use microwave repeater stations and related equipment and facilities at three locations on the northwest end of Kodiak Island, within the Refuge, hereinafter referred to as the "Project". The project would provide broadband telecommunication services to the remote communities of Larsen Bay and Karluk, which currently use private satellite networks.

Each repeater station would consist of a 50' free-standing, unlighted, lattice-type, microwave tower. Each tower will 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' diameter circle (5,024 square feet).

The project will be staged from private land in the Village Islands and Larsen Bay. The staging areas are not authorized under this permit. A barge will deliver equipment and materials to the staging sites and helicopters will be used to transport equipment, materials, and personnel to the communication sites. Approximately 70 helicopter flights to each repeater station will be required. Most of these flights will be with a Robinson R66 or R44 helicopter but numerous flights will require a larger Bell Huey 204. Construction is expected to begin in August and will end no later than October 24, 2016. If construction must occur during a second year, it will be restricted to a July 1 through October 24 construction window.

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 December 1 to February 28 or August 1 to October 24.

PROJECT SITE LOCATIONS

The Project sites authorized by this permit are located within the Kodiak National Wildlife Refuge in Alaska and are described as follows:

Tower Sites	Latitude	Longitude	Legal Description
Uganik	57.821392	-153.583114	T27S R27W, Section 24, SM
Spiridon	57.720636	-153.763478	T28S R28W, Section 26, SM
Z-Ridge	57.547833	-154.087333	T30S R30W, Section 27, SM

Map reflecting the location of the authorized installation sites are attached hereto as Exhibit "A".

DEFINITIONS

Meanings of certain terms used herein:

The term "Authorized Officer" means the Refuge Manager and Deputy Refuge Manager of Kodiak National Wildlife Refuge in Alaska, or designated representative in charge of the land under administration by the U.S. Fish and Wildlife Service. The Authorized Officer will monitor compliance with Permit terms, conditions and stipulations.

- 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 term Permittee includes the Permittee, its employees, agents, contractors, employees of the contractors or any persons visiting the permitted sites in connection with this authorization.

TERM AND RENT:

1. The term for this permit is for twenty (20) years or while it is used for the purpose granted, whichever period is shorter.
2. 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 \$7,000.95.
3. 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 Region 7 Collections Officer at (907) 786-3566.

4. 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.

INSURANCE

5. 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:
 - a. A binder or Certificate of Insurance demonstrating that the policy or policies are in place and effective, as required below.
 - b. Permittee shall maintain in effect throughout the term of this Permit general liability insurance or its equivalent with a limit of \$1,000,000 per occurrence. Such insurance shall name the United States as an additional insured and shall contain a "waiver of subrogation" provision.

BOND (PHASE I and II)

PHASE I (CONSTRUCTION ACTIVITIES)

6. Prior to commencement of any construction activities, the Permittee shall provide to the Service, (attention Chief, Division of Realty and Conservation Planning, at the address above):
 - a. Copy of the Permittee's Surety Bond or the Contractor's Bonds issued to Permittee's Contractor in the amount of one million dollars (\$1,000,000) per site under construction.
 - b. Certified statement that said bonds will remain in effect for the term of the construction contract between Permittee's Contractor and the Permittee.
7. Within 60 days of permit issuance and prior to Phase II Activities, the Permittee must submit a cost estimate from a licensed engineering firm for the actual costs associated with the removal of all structures/equipment and restoration activities associated with each site. The licensed engineering firm cost estimate will be utilized by the Service for the determination of the bond amount for Phase II of the project.

PHASE II (POST CONSTRUCTION ACTIVITIES)

8. Prior to commencement of any post construction activities, the Permittee shall provide to the Service, (attention Chief, Division of Realty and Conservation Planning) a surety bond in the amount determined per Stipulation 7. Attached hereto as Exhibit "B" is the bond form that shall be utilized for the surety bond during Phase II activities. The bond is required to secure all obligations imposed by the terms and conditions of this Permit and the bond amount is calculated to cover the anticipated cost of removal of the facilities and restoration activities. The bond must

meet the requirements of 31 U.S. C. §§ 9301-9309 and shall remain in place for the life of the project. The bond shall not be terminated until instructed in writing to do so by the Chief, Division of Realty and Conservation Planning.

9. Phase II must not commence until a written "Notice to Proceed" is given to the Permittee by the Service. The Service will provide a "Notice to Proceed" once the requirements in Stipulation 8 have been met.
10. The bond amount will be adjusted every five years hereafter using the following calculation based on the Consumer Price Index (CPI).

CPI is published by the Bureau of Labor Statistics of the United States Department of Labor. The bond amount will be calculated using the 5 year percentage change in the CPI for the 5 year period ending June 30 of the 5th year as listed in the table titled "Percentage Changes in CPI for All Urban consumers (CPI-U): U.S. city average" for the month of June, provided, however, in no event will the bond amount decrease.

If a substantial change is made in the CPI, or its publication is discontinued or changed in a way as to prevent calculations pursuant to this subparagraph, then the price index will be adjusted to the figure that would have been used had the manner of computing the CPI in effect for the permit term not been altered. If the CPI (or a successor or substitute index) is not available, a reliable governmental or other nonpartisan publication evaluating the information used in determining the CPI will be used.

11. Upon receipt of a Certification of Completion (as required in Stipulation 51) the Contractor's Bonds may be terminated.

GENERAL TERMS AND CONDITIONS

12. This permit is granted subject to outstanding rights, if any, in third parties.
13. The Permittee, by accepting this permit, agrees to the terms and conditions contained herein.
14. By accepting this Permit, the Permittee agrees to reimburse the United States for certain costs incurred by the Service in processing the Permit application.
15. Permittee agrees to comply with State and Federal laws applicable to the project within which the permit is granted, and to the lands which are included in the Permit, and lawful existing regulations thereunder.
16. This permit authorizes use only on the lands and waters of the Refuge subject to this permit. Use of land owned by a Native corporation, individual or State of Alaska, but located within the refuge boundaries is not authorized by this permit.
17. Permittee agrees to clear and keep clear the lands within the 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.

18. The construction or clearing of landing strips or pads is prohibited. Incidental hand removal of rocks and other minor obstructions is allowed.
19. 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.
20. Permittee agrees to restore the land to its natural, original, physical condition that existed prior to the disturbance, to the satisfaction of the Authorized Officer, so far as it is reasonably possible to do so upon revocation and/or termination of the permit, unless this requirement is waived in writing by the Authorized Officer.
21. 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.
22. 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 permit, except where the 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 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 permit area. Grants of 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 \$1,000,000.
23. Permittee agrees that all or any part of the 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 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 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 permit. No administrative proceeding shall be required where the permit terminates under its terms.

24. If the Authorized Officer determines that an immediate temporary suspension of activities within the Permit area is necessary to protect public health and safety, cultural resources or the environment, including adverse impacts to fish and wildlife resources or for seasonal constraints and weather, including high fire danger, flooding, unusual resource problems or other significant problems or emergencies, the Authorized Officer may issue an emergency suspension order to abate such activities without an administrative hearing.
25. 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.
26. 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 gender, race, creed, color, national origin, or sexual orientation and shall require an identical provision to be included in all subcontracts.
27. The permittee shall take no action that interferes with subsistence activities of rural users or restricts the reasonable access of subsistence users to Refuge lands. This may include but is not limited to disturbance of wildlife and their movements near subsistence hunters, and damage to cabins, trails, traditional campsites or caches used by subsistence users.
28. Permittee agrees that the 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 permit area unless approved in writing by the Chief, Division of Realty and Conservation Planning.
29. The Permittee and Permittee's employees, coworkers, or contractors do not have the exclusive use of the site(s) or lands covered by this permit.
30. 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. This includes co-location on the microwave towers if the use is compatible with the primary use of the original tower.
31. 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.

DISPOSAL, TRANSFER OR TERMINATION OF INTEREST

32. **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.

33. **Transfer of permit.** Any proposed transfer, by assignment, lease, operating agreement or otherwise, of a 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.
34. **Disposal of property upon termination of right-of-way.** In the absence of any agreement to the contrary, the holder of the right-of-way will be allowed six (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. The required Phase II Surety Bond will be utilized for the removal of the facilities and the cost of any restoration activities. Extensions of time may be granted at the discretion of the Chief, Division of Realty and Conservation Planning. The permittee is required to continue to make annual rental payments per Stipulation 2 until all removal and restoration activities have been completed per the satisfaction of the Authorized Officer.

SPECIAL STIPULATIONS

In addition to the special stipulations; Permittee must also comply with the General Stipulations listed above.

Stipulations Necessary to Ensure Compatibility:

35. Permittee must 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.
36. Impacts associated with trampling or crushing of vegetation must 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 must 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 must be inspected for the growth of invasive plants. If invasive plants are found at a site; the permittee, with guidance from the Refuge, must develop and implement a plan for eradication.
37. 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 must receive written approval from the Authorized Officer prior to flight.
38. Construction activities must only occur between July 1 and October 24 and maintenance and refueling activities must 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.

39. Barge traffic must remain at least three nautical miles from any sea lion haul-out or rookery, when possible, during transit to and from the staging and refueling areas. During construction, helicopter traffic will remain within the fly zones delineated in Exhibit C. Maintenance and refueling will remain at least three nautical miles from sea lion haul-outs.
40. While working in the staging area, the Permittee will not disturb the surface of the ground for cultural resource protection.
41. Towers and sheds will be tan in color or with a matte finish to help them blend into the environment as much as possible.
42. The Authorized Officer 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.
43. 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 Authorized Officer.
44. 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.
45. 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

46. Prior to beginning construction authorized under this permit, the Permittee must submit to the Authorized Officer a Plan of Development describing all construction related activities anticipated to be carried out under the authority of this permit. The plan must provide sufficiently detailed information to allow the Authorized Officer to effectively monitor activities to be carried out under the plan. Receipt and approval of the plan will be acknowledged in writing by the Authorized Officer. Proposed deviations from the Plan of

Development must be submitted in writing to the Authorized Officer, and will only be allowed with the written acknowledgment of the Authorized Officer. At the end of each construction season the Permittee shall provide a written report to the Authorized Officer 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 six (6) months from proposed construction for review and approval by the Authorized Officer.

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 or at the Kodiak National Wildlife Refuge office .
48. The Permittee is responsible for obtaining all necessary State and Federal permits and submitting copies to the Authorized Officer 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, must be clearly marked in a manner that will survive and be evident throughout construction of the facilities.
50. If construction is not commenced within one (1) year after permit issuance, the Service may cancel the permit.
51. Upon completion of construction, the Permittee must file two copies each of a Certification of Completion and as-built drawings and survey with the Chief, Division of Realty Conservation Planning, as proof of completion of construction.

Continuance of Operations

52. 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 must be submitted to the Authorized Officer for approval. Included in the plan must be the following:
 - a. Refueling and annual maintenance of the facilities must 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.
 - b. The Authorized Officer must be notified no less than fourteen days prior to commencement of annual maintenance or refueling operations. The Authorized Officer must be contacted again two days prior or the day of the scheduled operations to confirm all plans.
 - c. Flight routes to and from the facilities must avoid concentrated public use areas and sensitive wildlife areas to be identified by the refuge in advance.
 - d. Subsequent Plan of Operations must be submitted annually for approval and must be received by the Refuge office 30 days before the expiration of the current plan.
53. Permittee must notify the Authorized Officer of any and all occurrences that require or necessitate emergency repairs/maintenance to the facilities prior to commencement of activities if possible.

54. No later than January 15 of each year during the term of this permit, the Permittee will provide a report to the Authorized Officer 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 number 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).
 - c. Any service interruptions during the previous year as a result of equipment failures or other causes at these facilities, along with the cause and duration of those service interruptions.
55. 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 must be kept on site at all times during construction and during major and scheduled maintenance of the facilities.
56. The Permittee's contractor(s) must develop and have on site a Spill Prevention Control and Countermeasure Plan, as applicable. A copy of this plan must be submitted to the Authorized Officer prior to commencement of construction. If a spill does occur, the Authorized Officer must be notified immediately. Funds from the required surety bond will be available for any necessary contaminant clean-up.
57. All hazardous wastes (as defined by the Resource Conservation and Recovery Act of 1976, as amended) must be stored, transported, and disposed in accordance with regulation requirements.

General Conservation Measures

58. The transportation and presence of any pets and other live animals of any kind to or on the facilities are prohibited.
59. 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, subcontractors or any other individuals authorized to access the facilities who has had eight (8) hours of bear awareness training.
60. 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.
61. All helicopter flights to and from the sites must maintain a minimum altitude of 2000' Above Ground Level (AGL), weather permitting.

62. All food wastes must be stored in animal-proof containers and disposed on a weekly basis at a permitted off-Refuge facility.
63. All human waste must be removed from the site. All gray and black water or chemical toilet refuse generated at construction or production facilities must be transported off the Refuge to permitted treatment or disposal facilities.
64. 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 must be hauled off the Refuge and disposed in accordance with 18 AAC 60 (Solid Waste Regulations) and with 18 AAC 62 (Hazardous Waste Regulations).
65. ATV use is not permitted.
66. The Permittee is responsible for keeping the construction area clean. All trash, survey lath and other debris must not be stored on site. All trash, survey lath and other debris must be picked up daily and properly disposed of during the job. At the completion of construction, a final cleanup must be conducted by the Permittee and approved by the Authorized Officer.
67. Permittee is 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 must conduct a survey for invasive species at the facilities and surrounding area. A report on this survey must be provided to the Authorized Officer no later than January 15 of each year following the survey.
68. Permittee must 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.
69. Permittee must take such soil and resource conservation and protection measures on the land covered by the permit as the Authorized Officer may request.
70. Any problems with wildlife must be reported immediately to the Authorized Officer. The Permittee's employees, contractors, subcontractors and any other individuals authorized to access the facilities must not feed animals. Wildlife must not be harassed or intentionally approached closely enough to disrupt the animal's activity or to endanger human life. Taking of any animal except in the case of defense of life and property is not allowed. In the case of a defense of life and property taking, the Permittee must immediately contact the Alaska Department of Fish and Game and the Authorized Officer, and salvage those parts of the animal required by State regulations.
71. Permittee must 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 must immediately cease all work upon Federal land and notify the Authorized Officer.

72. The Permittee must report any instances of dead birds found in the project area to the Authorized Officer in a timely manner.

The remainder of this page is intentionally left blank.

THIS IS TO CERTIFY that the Permittee hereby accepts the permit described in this instrument, together with all terms and conditions thereof.

IN WITNESS WHEREOF, I have hereunto set my hand this 2nd day of August, 2016

Carl Marrs
Kodiak Microwave System, LLC

ACKNOWLEDGEMENT

STATE OF Alaska)
3rd Judicial District) SS.
COUNTY)

THIS IS TO CERTIFY that on the 2nd day of August, 2016, before me, a Notary Public in and for the State of Alaska, duly commissioned and swear as such, personally appeared Carl Marrs, who executed the within instrument on behalf of the Kodiak Microwave System and who acknowledged to me that the same was signed freely and voluntarily for the uses and purposes therein stated.

IN WITNESS WHEREOF, I have hereunto set my hand and affixed my official seal, the day and the year first written above.

Notary Public
CARRIE BERTSEN-CHU
State of Alaska
My Commission Expires Feb. 19, 2020
(SEAL)

Carrie Bertsen-Chu
Notary Public in and for the State of AK
My commission expires: Feb. 19, 2020

The Secretary of the Interior, acting by and through her authorized representative has executed this permit, known as M-348-KD, for the United States of America on this 5th day of August, 2016.

Maria Sel
U.S. Fish and Wildlife Service
for Chief, Division of Realty and
Conservation Planning

ACKNOWLEDGMENT

STATE OF ALASKA)
) ss:
THIRD JUDICIAL DISTRICT)

THIS IS TO CERTIFY that on the 5th day of August, 2016 before

me, a Notary Public in and for the State of Alaska, duly commissioned and sworn as such, personally appeared Mitch Ellis, known to me to be the Chief, Division of Realty and Conservation Planning, Region 7, U.S. Fish and Wildlife Service, who executed the within instrument and who acknowledged to me that the same was signed freely and voluntarily for the uses and purposes therein stated.

WITNESS my hand and notarial seal the day and year first above written in this certificate.

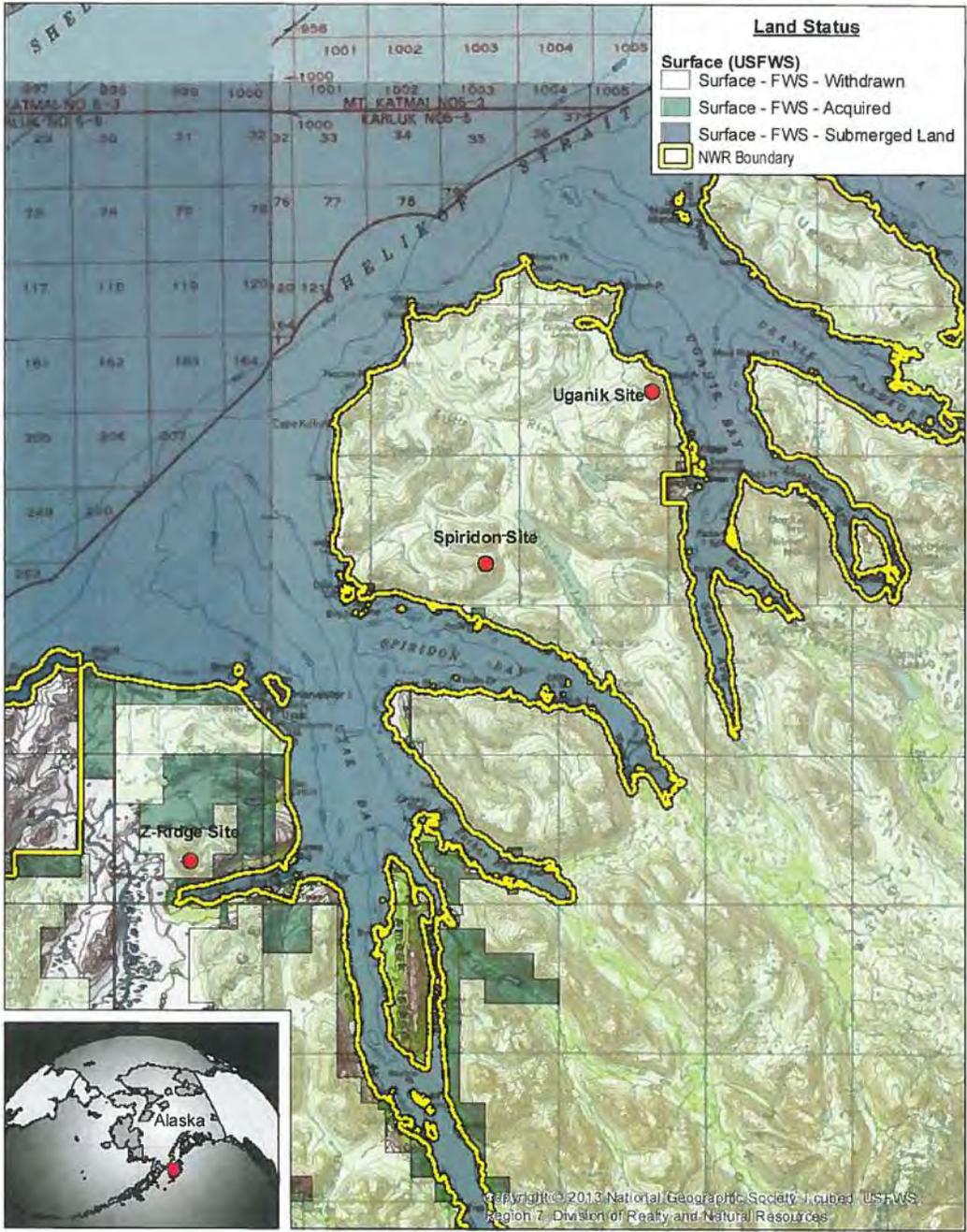
April M. Dent
Notary Public in and for Alaska
My commission expires: May 9, 2020





U.S. Fish & Wildlife Service

Kodiak Microwave System, LLC, T-348-KD, Exhibit A Location Map



Map generated June 1, 2016

**EXHIBIT B
BOND FORM**

KODIAK MICROWAVE SYSTEM, LLC, T-348-KD

Permit Number _____

KNOW ALL BY THESE PRESENTS, That we, [Permittee]

_____ as
Principal, and _____, a corporation organized
under the laws of the State of _____ and authorized to transact the business of
surety in the State of _____, as Surety, are held and firmly bound unto the United
States Fish and Wildlife Service in the just and full sum of
_____ Dollars (\$ _____), for
which sum, well and truly to be paid, we bind ourselves, our heirs, executors, administrators,
successors and assigns, jointly and severally, firmly by these presents.

THE CONDITION OF THIS OBLIGATION IS SUCH, That WHEREAS, the above bound
Principal has been or is about to be granted the above referenced right-of-way permit by the
U.S. Fish and Wildlife Service to _____ [permitted activities]
_____ on
the lands of the [refuge or administrative site],

NOW, Therefore, the principal/surety agree to apply this bond as security for the faithful
performance of any and all of the conditions and stipulations as set forth in this bond and in said
right-of-way permit. In the case of any default in performance of the conditions or stipulations of
such permit, it is agreed that the surety/principal shall apply the bond or any portion thereof, to
the satisfaction of any damages, assessments, late payment charges, penalties, or deficiencies
arising by reason of such default.

The principal/surety further agree that:



Appendix G. ANILCA Section 810 Subsistence Analysis

Project Description:

Kodiak Microwave Systems, LLC submitted an application to the Region 7 National Wildlife Refuge, Division of Realty and Conservation Planning requesting a right-of-way permit to construct three 50' free-standing, unlighted, lattice-type, microwave towers at Uganik, Spiridon, and Z-Ridge. As part of the project three additional towers will be constructed on private lands and are not part of the Service's permitting process. They include Larsen Bay, Karluk Passive, and Karluk Bay. All of the towers, regardless of the Service's permitting status, are included in Table 1 and Figure 1.

Table G - 1: Facility Locations and Elevations.

Tower	GPS Location	Elevation (ft)
Uganik	57°49'17.01"N 153°34'59.21"W	1,989
Spiridon	57°43'14.29"N 153°45'48.52"W	2,677
Z-Ridge	57°32'52.20"N 154° 5'14.40"W	2,174
Larsen Bay	57°32'14.52"N 153°58'47.94"W	Unknown
Karluk Passive	57°33'43.66"N 154°28'23.66"W	Unknown
Karluk Bay	57°33'49.41"N 154°26'4.70"W	Unknown

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 Service leased area will be an approximately 80' circle (5,024 square feet).

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.

Construction & Staging:

Construction for Uganik and Spiridon sites 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. The construction of Z-Ridge and Larsen Bay will be staged from the community of Larsen Bay and the construction of Karluk Passive and Karluk Bay will be staged from the community of Karluk. A barge will deliver equipment and materials from Anchorage, Alaska, or Seattle, Washington, to the staging sites 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 when possible. Helicopter flight lines are recommended to stay above 2000 feet above ground level (AGL), at least 3 nm from sea lion haul-outs and rookies, and use inland approaches to construction sites to minimize disturbance to sea lions..

Recommended flight zones are delineated in Figure 1. For each site 50 R-66 helicopter round trips and 20 Bell Huey 204 trips are expected. Construction is expected to begin in July and end in late September, 2016.

Long Term Maintenance & Refueling:

The towers are expected to be located on the refuge for 25 years. During the life of the project, maintenance trips will occur twice annually with a single helicopter moving from one site to the next, starting and returning to the City of Kodiak in a single day, if possible. Refueling will occur from a barge located in Uganik or Uyak Bay with twenty R-66 helicopter trips to each site to replace propane tanks at least every 18 months. Each site will require one day of helicopter work. Maintenance and refueling trips are limited to December 1 to February 28 or August 1 to October 24 to avoid nesting shorebirds and seabirds and denning bears.

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.

Table G - 2: Hunting and Fishing Seasons and Limits

Alaska State Hunting & Trapping Seasons & Limits		
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
Federal Subsistence Hunting Seasons & Limits (Kodiak Refuge Lands Only)		
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
Migratory Bird Hunting Seasons & Limits (Oct 8 – Jan 22 for all)		
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.
Subsistence Migratory Bird Harvest Seasons & Limits (Apr 2 – Aug 31)		
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
Alaska State Sport Fishing Seasons & Limits (Fresh Water)		
King Salmon	>=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	>=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 >=20 inches. Annual limit of 2 fish.
Dolly Varden & Arctic Grayling	10 per day, 10 in possession	Year Round
Other Species	No limit	Year Round
Alaska State Sport Fishing Seasons & Limits (Salt Water)		
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 >=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
Alaska State Subsistence Fishing Seasons & Limits		
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	
Federal Subsistence Fishing Seasons & Limits (Federal waters only)		
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:

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 three 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.

Appendix H. State Historic Preservation Office



United States Department of the Interior

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



IN REPLY REFER TO:
FWS/R7/NWRS716-0045

MAY 27 2016

Judith Bittner, State Historic Preservation Officer
Alaska Department of Natural Resources
Division of Park and Recreation
550 West 7th Avenue, Suite 1310
Anchorage, Alaska 99501-3565

Dear Ms. Bittner,

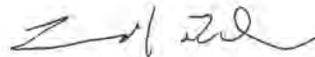
U.S. Fish and Wildlife Service (USFWS) is reviewing a Right-of-Way permit application from Old Harbor Native Corporation and Kodiak Microwave System, LLC, that proposes to install telecommunication towers within the Kodiak National Wildlife Refuge (Kodiak NWR) to provide internet services to the communities of Larsen Bay and Karluk. Pursuant to Section 106 of the National Historic Preservation Act and implementing regulations 36 CFR 800, USFWS has determined that the proposed undertaking would cause no adverse effect to historic properties.

The proposed undertaking was investigated by Cultural Resource Consultants, LLC (CRC). As summarized in the enclosed report (CRC 2016), proposed tower sites on Kodiak NWR administered lands have no known and low potential for previously unrecorded cultural resources or historic properties.

However, the proposed staging area does possess a recorded prehistoric site, KOD-00300. The site is located on private property and USFWS issuance of a ROW permit has no jurisdictional control of the applicants' activities off USFWS administered lands. Regardless, the staging area was investigated by CRC and is included in the Section 106 review. USFWS agrees with CRC's recommendations that the applicant would be able to operate within the proposed staging area, in the manner prescribed in the enclosed report, without causing any direct, indirect, or cumulative adverse effects to the eligible historic property, KOD-00300.

On behalf of USFWS, I look forward to your response.

Sincerely,

A handwritten signature in black ink, appearing to read 'E. DeCleva', written in a cursive style.

Edward J. DeCleva
Regional Historic Preservation Officer

Enclosure: Cultural Resource Literature Review for the Proposed Kodiak Microwave System, LLC Telecommunication Project, Kodiak Island, Alaska. Cultural Resource Consultants, LLC, 2016.



THE STATE
of **ALASKA**
GOVERNOR BILL WALKER

Department of Natural Resources

DIVISION OF PARKS & OUTDOOR RECREATION
Office of History & Archaeology

550 West 7th Ave., Suite 1310
Anchorage, Alaska 99516-3840
CLASSIFICATION:
APPROPRIATE FOR PUBLIC RELEASE

June 9, 2016

File No.: 3130-1R Fish & Wildlife

Edward J. DeCleva
Regional Historic Preservation Officer
U.S. Fish & Wildlife Service
1011 E. Tudor Road
Anchorage, Alaska 99503

Subject: Right-of-Way permit application for Telecommunication Towers within the Kenai National Wildlife Refuge

Dear Mr. DeCleva:

The Alaska State Historic Preservation Office (AK SHPO) received your correspondence (dated May 27, 2016) on June 1, 2016.

Following our review of the documentation provided, we wish to remind the U.S. Fish & Wildlife Service (USFWS) that a project's area of potential effects (APE) should be defined based on the 'geographic area or areas within which an undertaking may directly or indirectly cause alterations in the character or use of historic properties, if any such properties exist' (36 CFR 800.16[d]). It is not defined based on land ownership. Therefore, we would argue that for the purposes of Section 106 compliance, the USFWS does have the responsibility to consider effects to historic properties both on and off USFWS-administered lands when issuing a permit or authorization.

Regardless, we concur with the recommended determination that KOD-00300 is **eligible** for the National Register of Historic Places (NRHP) under Criterion D. Furthermore, we have reviewed the management recommendations provided within the cultural resource survey report for avoiding/minimizing effects to the site and agree that if implemented as prescribed, a finding of **no adverse effect** is appropriate for the proposed undertaking.

Should unidentified archaeological resources be discovered in the course of the project, work must be interrupted until the resources have been evaluated in terms of the National Register of Historic Places eligibility criteria (36 CFR 60.4) or Alaska Landmarks status in consultation with our office.

Thank you for the opportunity to comment. Please contact Shina duVall at 269-8720 or shina.duvall@alaska.gov if you have any questions or if we can be of further assistance.

Sincerely,

A handwritten signature in cursive script, appearing to read "Judith E. Bittner".

Judith E. Bittner
Deputy State Historic Preservation Officer

JEB:sad

Appendix I: Received Comment Letters & Response

5/5/2016

DEPARTMENT OF THE INTERIOR Mail - Public notice



Fischbach, Tracy <tracy_fischbach@fws.gov>

Public notice

G.Steele Davis <steele@spiritofalaska.com>
To: tracy_fischbach@fws.gov

Thu, May 5, 2016 at 11:51 AM

Hello Tracy,
I hope this finds you well.

I do have some questions about this microwave, broadband system to be installed on my refuge.

1. Who's paying for this project?
2. How will surrounding non village dwellers benefit from this broadband system?
 - a. will people that don't live in these direct service area's be able to construct antennas and be able to use this system?
3. Who is going to pay for this Service once it's completed? Who will be able to afford this once it's all constructed? 5+ million dollars is a lot of money.
4. What is the coverage are of the signal from the final, output towers?
5. What effect will this microwave/broadband signal have on our environment? Lil brown bats. Bald Eagles, Migratory birds, Stellar Sea lions, Sea Otters, Migrating sea Mammals, etc.
6. Will other network & cellular providers be able to piggy back on these towers?
7. What is the reliability rate of service?
8. Why not put up a satellite that covers the entire Island and has no impact foot print on our Refuge?
9. I see a direct impact to the subsistence life style. It has been proven and you can just look around at the impact that internet and microwave towers have on the general public in the rest of the world. This is going to be destructive and have negative impact to the native culture. They will be on the internet and not outside hunting and gathering, they will be transformed into Zombies...

Thank you Tracy. I look forward to your reply.

Standing by

~Steele Davis~
Owner/Operator
Spirit of Alaska Wilderness Adventures
www.spiritofalaska.com
steele@spiritofalaska.com



Kodiak Microwave Systems, LLC

2702 Denali Street, Suite 100
Anchorage, Alaska 99503

May 9, 2016

Tevis Underwood
Tracy Fischbach
Acting Refugee Manager
Kodiak National Wildlife Refuge
Fish and Wildlife Service
United States Department of the Interior
1011 E Tudor Road
Anchorage, Alaska 99503

RE: NWRS716-0039

Dear Mr. Underwood and Ms. Fischbach,

Kodiak Microwave System, LLC ("KMS") received a copy of the "Invitation to Review and Comment on Draft Environmental Assessment and Compatibility Determination for the Kodiak Telecommunications Project" (hereinafter "Draft Compatibility Determination") issued by the Fish and Wildlife Service ("FWS"). In that Draft Compatibility Determination, FWS states:

After careful evaluation of the 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.

(emphasis in original).

As KMS previously advised FWS, Alternative 2 (Inner Route) **is not a viable option at this time**. As described by FWS, Alternative 2 (Inner Route) would require the construction of two towers, one at Midridge and one on Larsen Peak. There is, however, no viable pathway for the microwave transmission between Midridge and Larsen Peak. Please see the attached pathway analysis prepared by New Horizons Telecom, Inc. There is no viable direct path between Midridge and Larsen Peak due to a 3,000 foot mountain obstruction.

When KMS originally began the process to obtain a right-of-way, KMS did contemplate a route similar to FWS's Alternative 2 (Inner Route). That route, however, was based on KMS's ability to co-locate facilities on a tower operated by the Kodiak Energy Association, Inc. ("KEA"). With a co-locate on the KEA tower, KMS would have been able to avoid the 3,000 foot mountain obstruction that renders FWS's existing Alternative 2 (Inner Route) non-viable. Earlier this year, however, KEA made the decision that it would not permit KMS to co-locate facilities on its tower. FWS was subsequently advised by KMS of KEA's decision and the fact that KEA's decision rendered Alternative 2 (Inner Route) not viable.

The only viable path available to KMS is the coastal route, with installation of towers on Uganik, Spiridon, and Z-Ridge. KMS is able to build those towers and related facilities in a manner

that will have minimal impact on the Kodiak National Wildlife Refuge, while also providing much needed telecommunication services to the Larsen Bay community. KMS therefore requests that FWS revise its Draft Compatibility Determination to identify the coastal route as the proposed route for approval, given that it is the only viable pathway available to KMS.

In order to address FWS's concerns regarding the sea lion rookery, KMS is willing to agree to establish a "no-fly zone" of reasonable size around the sea lion rookery, such that KMS's helicopter flights will not pass near the rookery or disturb the sea lions located there. This option should be sufficient to address any environmental concerns regarding the coastal route, and to render that route the preferred and approved route for KMS's microwave system.

The Draft Compatibility Determination also suggests that Alternative 2 (Inner Route) is the preferred alternative because it will require the construction of only two towers, rather than the three towers required by the coastal route. That is not accurate. The third tower, located on Z-Ridge, is necessary for KMS to provide telecommunication services to the community of Karluk. The construction of a tower on Z-Ridge has always been contemplated by KMS as a necessary tower given KMS's intention to provide such telecommunication service to Karluk in the future. While KMS does not anticipate providing such service to Karluk in 2016, it is within KMS's business plan and, for efficiency's sake (and because the Z-Ridge site is necessary to provide access to the Larsen Bay site, as discussed above), Z-Ridge should be included in this current right-of-way process.

KMS would also like to point out that KMS developed the coastal route at FWS's specific request, based on FWS's objections to the original proposed Inner Route. Given KEA's refusal to permit KMS to co-locate on their tower, the Inner Route is no longer viable, such that the route originally proposed by FWS, the coastal route, should be the approved route.

There is no reason to further delay this process. The microwave towers that KMS will be construction are essential to improve the health, safety, emergency, and medical communications for Larsen Bay, as well as for general communications that will link Larsen Bay to the world. **KMS started this right-of-way process in January of 2015, and has made every effort to modify, adjust, and conform the project to address and accommodate the concerns expressed by the FWS.** It is now May of 2016, **some seventeen months since KMS first filed for our permits,** and the public notice and comment has just begun and FWS is proposing as recommended alternative a pathway that is not viable due to a 3,000 foot mountain obstruction. This process is not acceptable.

The towers that KMS will construct are not large, nor do they constitute a major construction project. They are comprised of three towers, each with a small footprint on the ground and KMS will comply with the FWS's requirements to minimize the impact on the surrounding environment. Although the construction is minor, it will have significant positive impact on the for health, safety and general communications of Larsen Bay. KMS already has several different towers erected and operating on Kodiak Island, with minimal impact to their surroundings, including one on conservation easement managed by the Kodiak National Wildlife Refuge that was authorized by the Refuge Manager in 2014. There is no reason that the coastal route cannot be approved by FWS.

KMS therefore requests that FWS immediately revise its Draft Compatibility Determination to reflect the fact that Alternative 2 (Inner Route) is not viable, and that the coastal route is both the only viable route and the preferred alternative for FWS. Immediate and prompt action is needed by FWS on approval of the requested right-of-way, given the limited construction season available to KMS, or construction of the project will be delayed until next year.

Thank you for your prompt attention to this matter. Please do not hesitate to contact me if necessary.

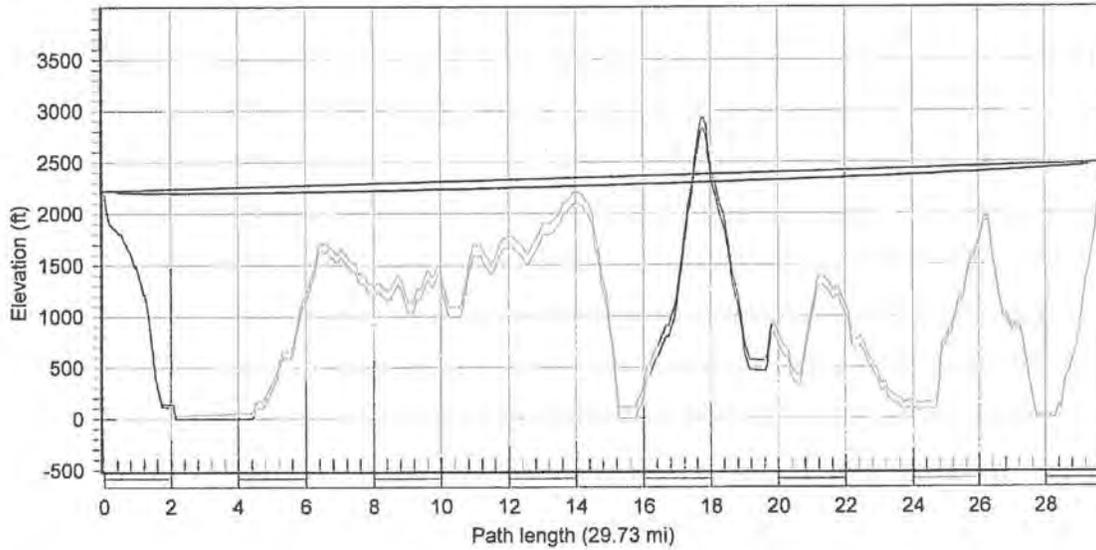
Sincerely,



Carl Marrs
Manager
Kodiak Microwave Systems, LLC

CC: Senator Lisa Murkowski
Senator Dan Sullivan
Representative Don Young

KODIAK MICROWAVE SYSTEM



F = 6000.00 MHz K = 1.33 %F1 = 100.0, 60.0

	ELBOW ALT	MIDRIDGE
Latitude	57 47 21.11 N	57 38 33.05 N
Longitude	152 47 53.80 W	153 33 09.99 W
True azimuth (°)	250.35	69.72
Elevation (ft)	2222.33	2486.86
Tower height (ft)		30.00
Antenna height (ft)	0.00	0.00
Thermal fade margin (dB)		

Multipath fading method - Vigants - Barnett
 Rain fading method - Rec. ITU-R P.530-8/13 (R837-5)

May 18, 2016

Tracy Fischbach
Natural Resource Planner
US Fish & Wildlife Service
1011 East Tudor Road, MS 231
Anchorage, AK 99503



Dear Ms. Fischbach:

Thank you for the opportunity to review and comment on the Draft Environmental Assessment and Compatibility Determination for the Kodiak Telecommunications Project. Koniag is familiar with Kodiak Microsystems, LLC's efforts to bring high speed broad band service to the six villages on Kodiak Island, a critical infrastructure need in the communities of Larsen Bay and Karluk.

Koniag is strongly in favor of this project and urges the USFWS to approve and permit the construction of three towers as proposed in Alternative 3 (Outer Route) as this is the route will provide reliable service to the communities. Reliability is paramount in this project as broadband capability brings crucial health, safety, and emergency communications capability to Larsen Bay and Karluk in addition to general communications.

This project entails construction of three towers no taller than 60 feet on a small footprint on the tops of mountains in the KNWR. The positive impact of this project for the two communities far outweighs the minimal impact the KNWR.

Given that the USFWS has had this project under review since January of 2015 and we are fast approaching the construction window for 2016, it is critical that Kodiak Microwave Systems, LLC receive its permit in the very near future, Koniag, Inc. urges the USFWS to finalize and approve the permit for the "Outer Route" in an expeditious manner in order for construction to take place this season.

Sincerely,

Tom Panamaroff
President

Cc: The Honorable Lisa Murkowski, United States Senate
The Honorable Dan Sullivan, United States Senate
The Honorable Don Young, United States House of Representatives

4300 B Street, Suite 407
Anchorage, Alaska 99503
(907) 561-2668
FAX (907) 562-5258

Responses to Comments

Comment: Mr. Davis had questions regarding the economics of the project. For example, who is paying for the development project and who will be using the broadband service once it is available.

Response: Kodiak Microwave Systems, LLC, (KMS), a subsidiary company of the Old Harbor and Ouzinkie Corporations, is the company pursuing the permit. KMS would be responsible for all costs associated with the project. Identifying the customers of the project once it is completed, is outside of the scope of the Service's evaluation of the project.

Comment: Mr. Davis had several questions regarding the coverage area, use, and reliability of the broadband signal and whether individuals outside of the communities would be able to use the broadband service.

Response: This project is solely for the construction and maintenance of remote microwave repeater stations. Microwaves are used for point to point transmission of signals from one antenna to the next through a very narrowly focused signal. Microwave signals are not intended for use by the end user, but to bring information to a hub, similar to a fiber optic line. Currently, Larsen Bay and Karluk are served by a satellite service which has been found to be slow and unreliable. The coverage of the final output towers or other services to be provided as a result of this project were considered outside of the scope of this evaluation and therefore not included in the EA. Similarly, the reliability of the service was not included in the evaluation as it did not directly affect the environment.

Comment: Mr. Davis questioned whether other network and cellular providers would be able to “piggy back” on the towers.

Response: In order to decrease the footprint of future developments on refuges, a stipulation is added to all Service right-of-way permits that says:

“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.”

Comment: Mr. Davis questioned whether the microwave signal would affect wildlife species on the refuge.

Response: According to Albert Mannville, a Service migratory bird biologist, (2009), the potential effects of non-ionizing, non-thermal tower radiation on birds is currently unknown, but there is anecdotal evidence in the literature that electro-magnetic frequencies can lead birds and other animals to avoid these areas (Balmori 2003). Given the limited number of towers and the narrowness of the microwave signal, we continue to expect minor effects to

bird populations in the area. Because the antennae are several feet above the ground we do not expect effects to terrestrial wildlife.

Comment: Mr. Davis had concerns that providing access to faster and more reliable internet access would change the way people use their time in an unhealthy way.

Response: This concern is outside the scope of the Service's evaluation of the project.

Comment: KMS informed the Service that the preferred alternative selected in the draft EA was not a viable option, due to the lack of an agreement with Kodiak Electric Association.

Response: After multiple discussions with KMS and the State of Alaska Department of Natural Resources regarding the steps that would be needed to make alternative 2 viable again, the Service moved alternative 2, "the inner route alternative" to the list of Alternatives Considered and Dismissed. The document was edited to reflect this change.

Comment: Koniag Incorporated commented that they support the selection of the Outer Route as the preferred alternative.

Response: None needed.



U.S. Fish and Wildlife Service
1011 East Tudor Road
Anchorage, AK 99503