Copper River Basin Landscape Assessment and Management Plans

Executive Summary

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COPPER RIVER AHTNA INTERTRIBAL NATURAL RESOURCE CONSERVATION DISTRICT

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Table of Contents

Acknowledgments

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Introduction

Copper River Ahtna Intertribal Natural Resource Conservation District (CRITR) was awarded a USDA Natural Resources Conservation Service (NRCS) Conservation Innovation Grant (CIG) to develop an ecologically-based landscape assessment across all of Ahtna lands in southeast Alaska. CRITR was established to link the two land-owning corporations Ahtna, Inc., and Chitina Native Corporation, with the Ahtna Tribes to promote stewardship of subsistence resources including an integrated approach to food production through habitat enhancement, biomass energy production, and wildfire protection. CRITR serves 8 tribal communities and Ahtna, Inc. as a tribal consortium and community-based organization.

To achieve the objectives of a sustainable and integrated approach to land management, CRITR recognized the need for an ecologically-based landscape assessment to inform future goals for land management. Further, important ecological tools to support the landscape assessment, such as ecological site descriptions, had not been developed for this region. Ecological site descriptions are used in landscape assessments to help describe natural ecological processes and native ecosystem diversity (Haufler et al. 1996) which can in turn be used to inform management decisions for subsistence food production, sustaining wildlife habitat, and biomass energy production. Important outputs of this project are the development of management plans for the Ahtna lands surrounding each of the 8 tribal communities. These plans also consider wildfire planning at landscape scales. Wildfire has been aggressively suppressed in this region for the past 40 years resulting in more homogenous vegetation conditions when compared to the historically diverse vegetation mosaic produced by naturally occurring wildfires. Less diverse vegetation types and structures can result in reduced moose habitat quality. Each of the management plans were informed by the results of the landscape assessment and integrate the objectives of expanding the role of wildfire in desired outlying areas, improving moose habitat, producing biomass for use by the nearby communities, and protecting high value caribou habitat. An additional objective to support the carbon sequestration program of Ahtna, Inc. was added towards the end of the project. This report summarizes the results of the landscape assessment and presents the management plans for each of the 8 tribal communities and a broader landscape plan for surrounding Ahtna lands.

The primary objectives of this project include:

1. Conducting an ecologically-based landscape assessment for the region that includes Ahtna lands;
2. Developing an ecological site classification as the foundation for evaluating vegetation changes and wildlife habitat quality;
3. Developing management plans for each of the 8 tribal communities that:
    - Improve moose habitat through mechanical treatments;
    - Evaluate and recommend an expanded use of prescribed burning or let-burn wildfire areas;
    - Increase opportunities for moose harvest through selection of habitat improvement areas to attract moose into accessible sites;
    - Produce biomass through mechanical treatments for use as a local fuel;
    - Protect caribou habitat quality and berry production areas;
    - Maintain ecosystem integrity within the project area, and;
    - Support carbon sequestration goals.

The project area included all of the Ahtna Traditional Use Territory with emphasis on the lands owned by Ahtna, Inc. or its member tribes (Figure 1).

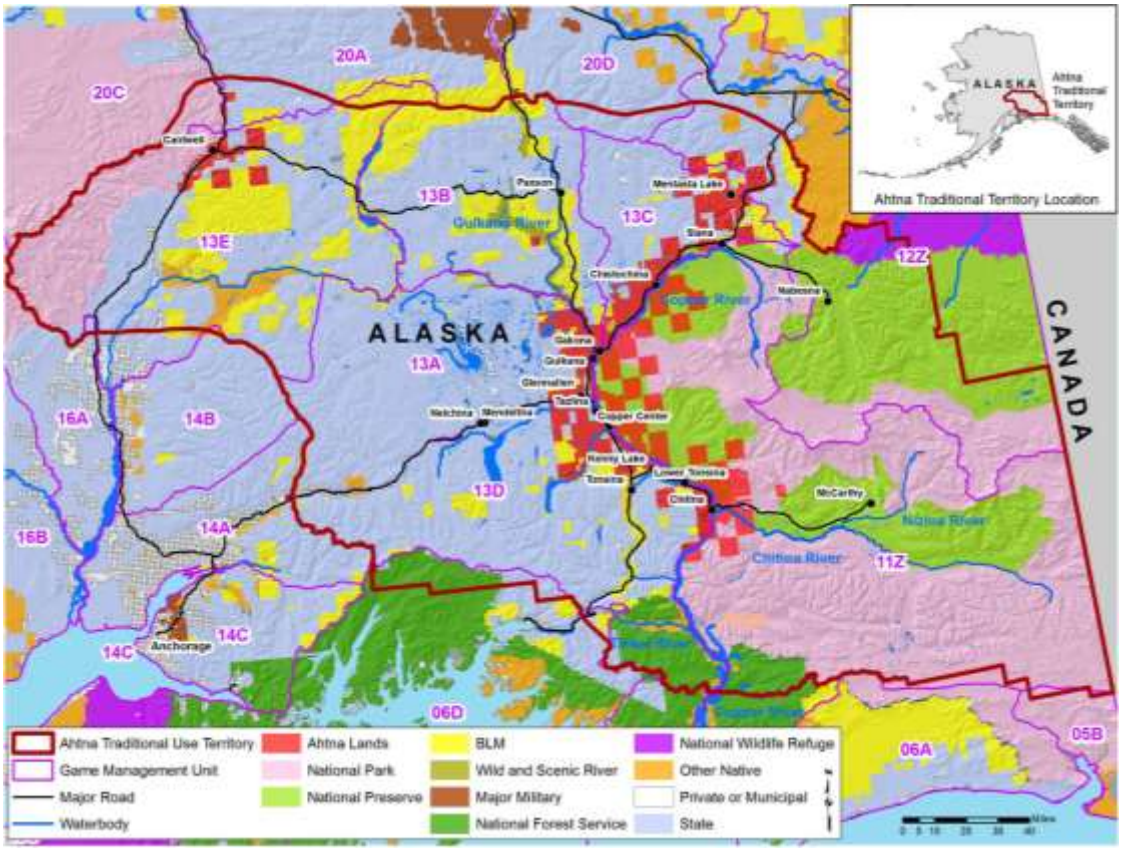

Figure 1. Surface land ownership patterns in the Ahtna Traditional Use Territory.

Ecosystem Diversity

A landscape assessment was conducted for the project area to describe and quantify ecosystem diversity for terrestrial and riparian and wetland systems. To support this effort, an ecosystem-based landscape classification system was developed and mapped in a GIS for use by CRITR and Ahtna Inc. An ecosystem is considered a specific plant community defined by abiotic setting as well as its species composition and structure in response to normal successional and/or disturbance processes, and is thus a very specific description of a repeating vegetation community and its associated abiotic environment. Ecological site is a term frequently used by land managers and landscape ecologists to classify and delineate the abiotic environment and will be used in this assessment. Disturbance class will be the term used to classify and delineate the species composition and structure for a vegetation community in response to typical successional and/or disturbance processes. The combination of a single ecological site with a single disturbance class will be referred to as an ecosystem. A tool called the ecosystem diversity framework is used in this project to illustrate and capture all of the ecosystem classification components for an ecoregion and is presented in a matrix format. The matrix "cells" in the framework represent the total ecosystem diversity for the defined ecoregion. To reduce the complexity and provide more consistency within a framework, four ecosystem diversity frameworks were developed for each ecoregion to represent upland forested, upland grass and shrub, riparian forested, and riparian grass and shrub systems. Figure 2 provides an example of the ecosystem diversity framework for upland forest systems of MLRA ecoregion 222. Figure 3 provides an example of the mapped ecosystem diversity for the Tazlina Village planning region.

MAJOR LAND RESOURCE AREA 222 - Upland Forested Systems

ECOLOGICAL SITE *(based on LANDFIRE - BIOPHYSICAL SETTINGS)*

STAGE/ STRUCTURE	16042[a] Mesic Black Spruce	16460 Western Hemlock	16790 White Spruce-Hardwood	16012 Treeline White Spruce	16440 Sitka Spruce	16481 Mountain Hemlock North	16500 Periglacial Wood-Shrubland
	Canopy Cover[b] Open / Closed	Canopy Cover Open / Closed	Canopy Cover Open / Closed	Canopy Cover Open / Closed	Canopy Cover Open / Closed	Canopy Cover Open / Closed	Canopy Cover Open / Closed
GFS/SEEDLING-SAPLING (DBH<5")	A[c] (10%)[d]: BENA[e], LEDUM, VAUL, VAVI	A (5%): TSHE, PISI, VAOV, MEFE	A (5%): CACA4, EQAR, CHAN9, MEFE	A (5%): BENA, VAUL, LEGR, SAPU15	A (100%): PISI, OPHO, VAOV, SARA2	A (5%): VAOV, MEFE, RUSP	A & B (15%): DRDR, EQVA, CHLA13, ALVIS, SAAL, SASI2, SABA3
POLE (DBH 5-9")	B (10%): PIMA, PIGL, BENA, LEDUM C (5%): BEPA, POTR5, PIMA, PIGL	B (15%): TSHE, PISI	B (15%): PIGL, BEPA, POBA2, POTR5 C (10%): PIGL, BEPA, POBA2, POTR5	B (5%): PIGL, BEPA, BENA		B (35%): TSME, PILU, MEFE, ALVIS C (60%): TSME, PILU, MEFE, ALVIS	C (25%): POBA2, PISI, ALVIS, SALIX
MEDIUM (DBH 9-20")	D (50%): PIMA, PIGL, BENA, LEDUM E (25%): PIMA, PIGL, BENA, LEDUM	C (20%): TSHE, PISI, VAOV, MEFE D (60%): TSHE, PISI, VAOV, MEFE	D (65%): PIGL, BEPA, POBA2, POTR5 E (5%): PIGL, BEPA, POBA2, POTR5	C (90%): PIGL, BENA, VAUL, CLADI3			D (60%): PISI, RUSP, SARA2, OPHO
LARGE (DBH >20")							
ACRES	110,862	74,695	55,120	39,105	16,683	4,355	2,502

Figure 2. Example of ecosystem diversity framework developed for Major Land Resource Area 222 – Upland Forested Systems. See Final Report for definitions.

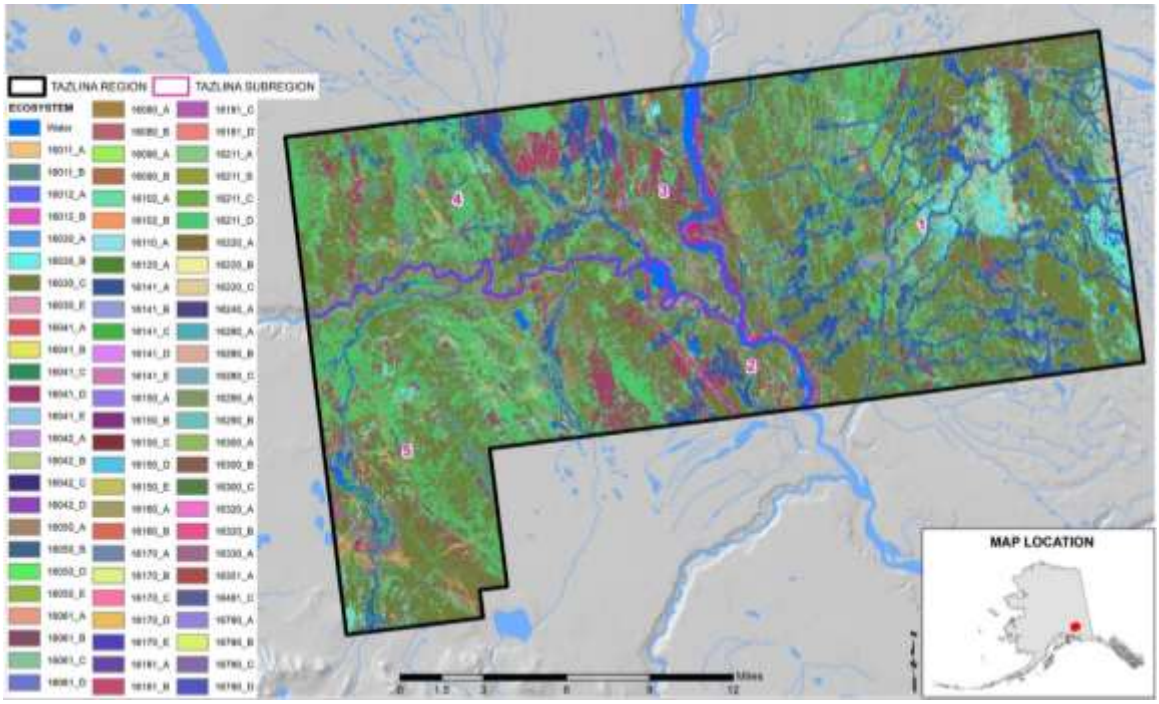

Figure 3. Ecosystem diversity in the Tazlina Planning Region within the Ahtna Traditional Use Territory. See Appendix A of the Final Report for ecosystem code definitions.

Moose and Caribou Habitat Quality Assessment Models

Moose and caribou habitat quality models were developed to utilize the ecosystem diversity classification. The models attributed each ecosystem with a habitat quality value for moose or caribou. Using this, both an ecosystem-scale and landscape scale evaluation of habitat quality was conducted for each species for several different seasonal use periods. Examples are shown in Figures 4 and 5.

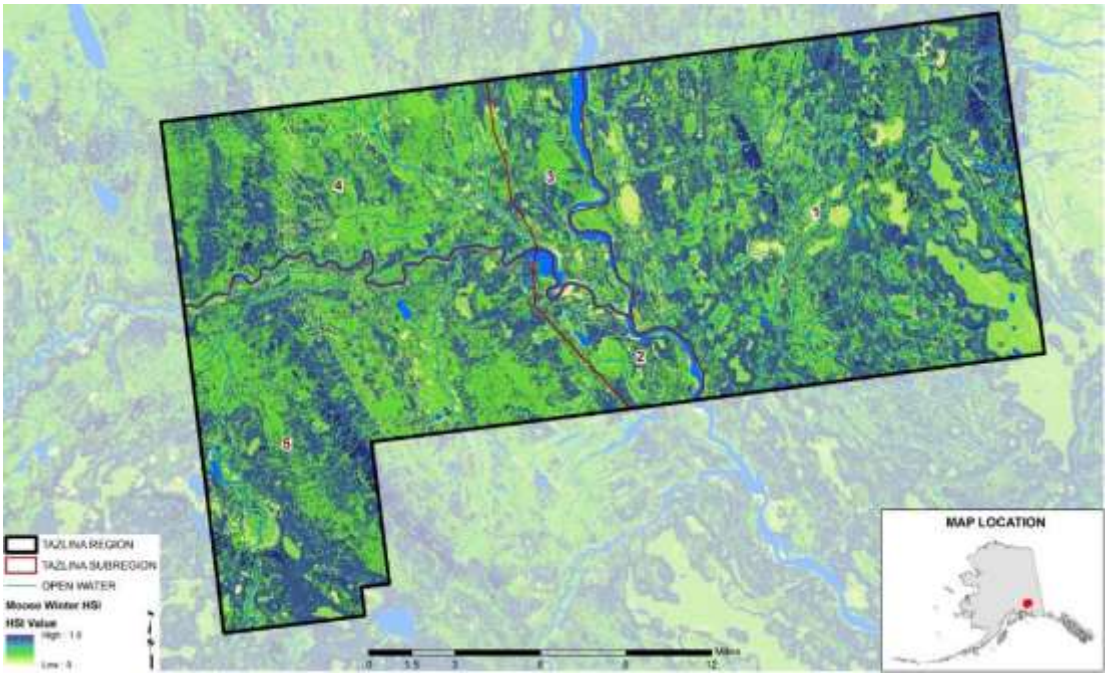

Figure 4. Results of the ecosystem-scale model outputs for moose winter habitat quality in the Tazlina region.

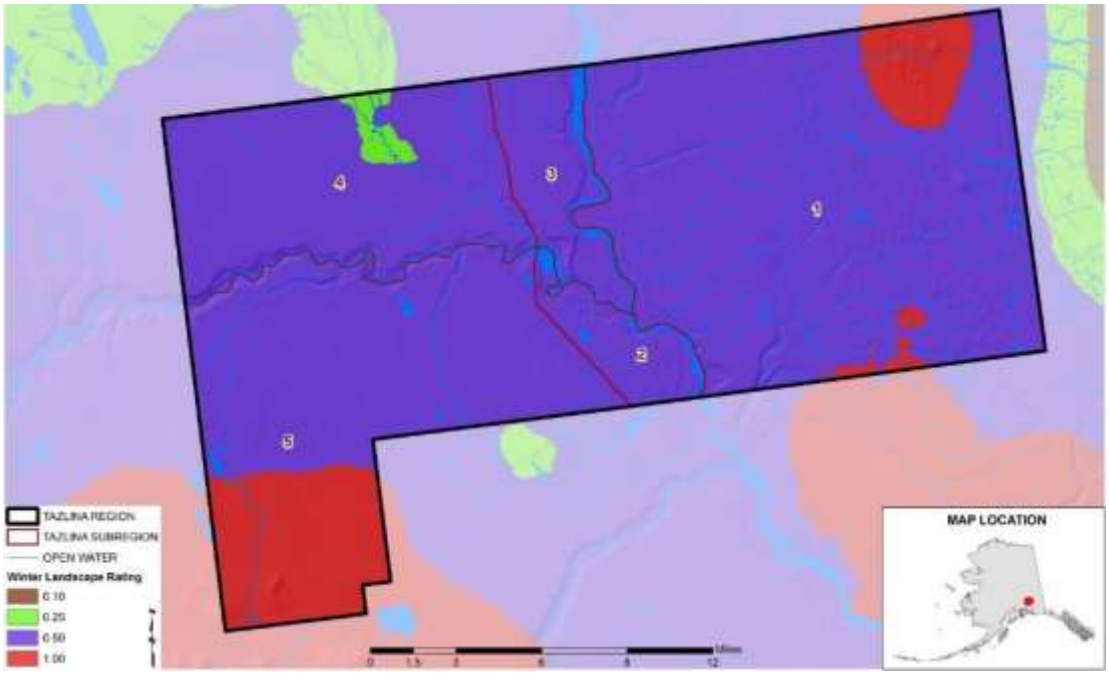

Figure 5 Results of the landscape-scale model outputs for moose winter habitat quality in the Tazlina Village planning region.

Berry Production Areas

Maps of potential berry production areas based on the ecosystem diversity classification were also developed. Figure 6 displays an example of berry harvest potential for the Tazlina Village region.

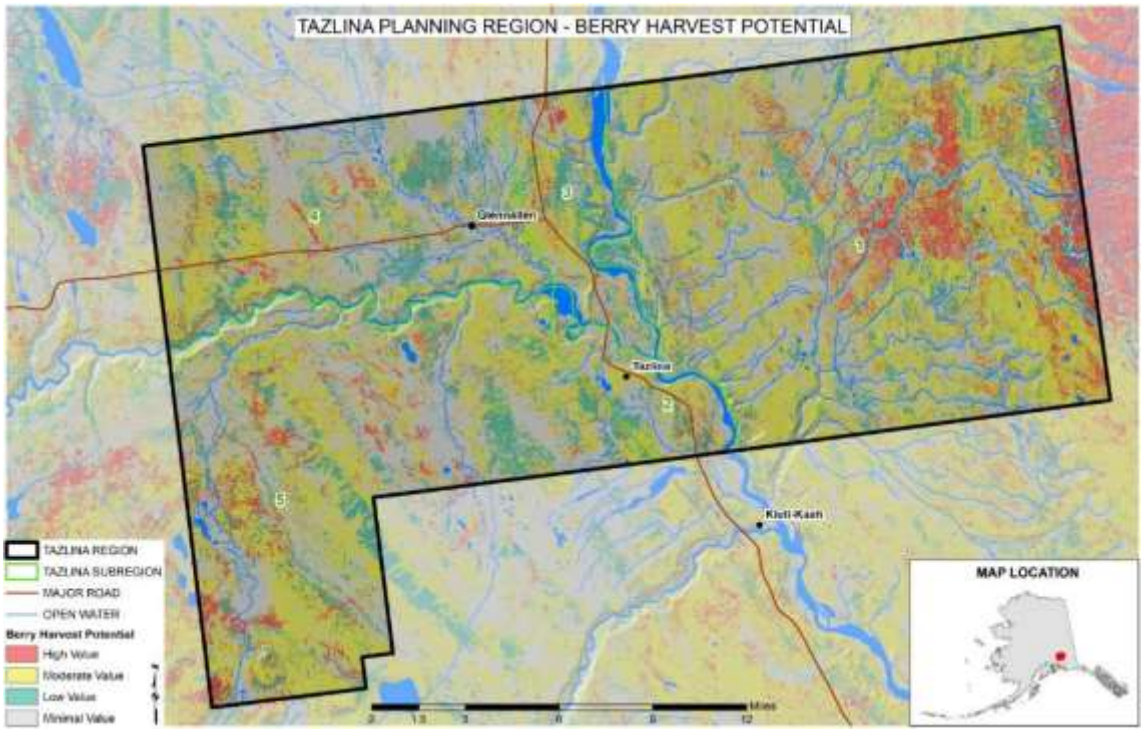

Figure 6. Potential berry production values in the Tazlina Village planning region.

Tribal Village Local Management Plans

A management plan was developed for each of the 8 villages that identified proposed treatment areas within each planning region. The 8 village planning regions are shown in Figure 7. Site selection for improvement areas focused on two types of treatments. These were moose browse improvements and timber stand improvements. Moose browse improvements are intended to increase the foraging quality of a stand primarily by increasing the productivity of preferred willow species. Timber stand improvements are mainly intended to increase the growth rates and quality of timber, particularly in white spruce stands. These treatments can also generate biomass and firewood for local communities. The selection criteria for improvement areas were similar for both types of treatments. The first consideration was that stands must occur on lands owned by Ahtna, Inc. Another consideration was that the stand should have good access in the form of an existing road or trail. Third, the selected stands needed to have productive soils that were also well suited to management activities. The next criterion was that the site had a high potential for willows for moose treatments or white spruce if considering a timber stand improvement. Another factor in site selection was to avoid areas that provide high quality caribou habitat as both moose browse treatments and timber stand improvements could prove detrimental to caribou forage (primarily lichen). A final consideration was whether the site had high potential for berry production, with efforts made to avoid disturbance to high quality sites. Figure 8 displays a map of identified treatment areas in the Tazlina Planning Region, while Table 1 lists characteristics of these treatment areas.

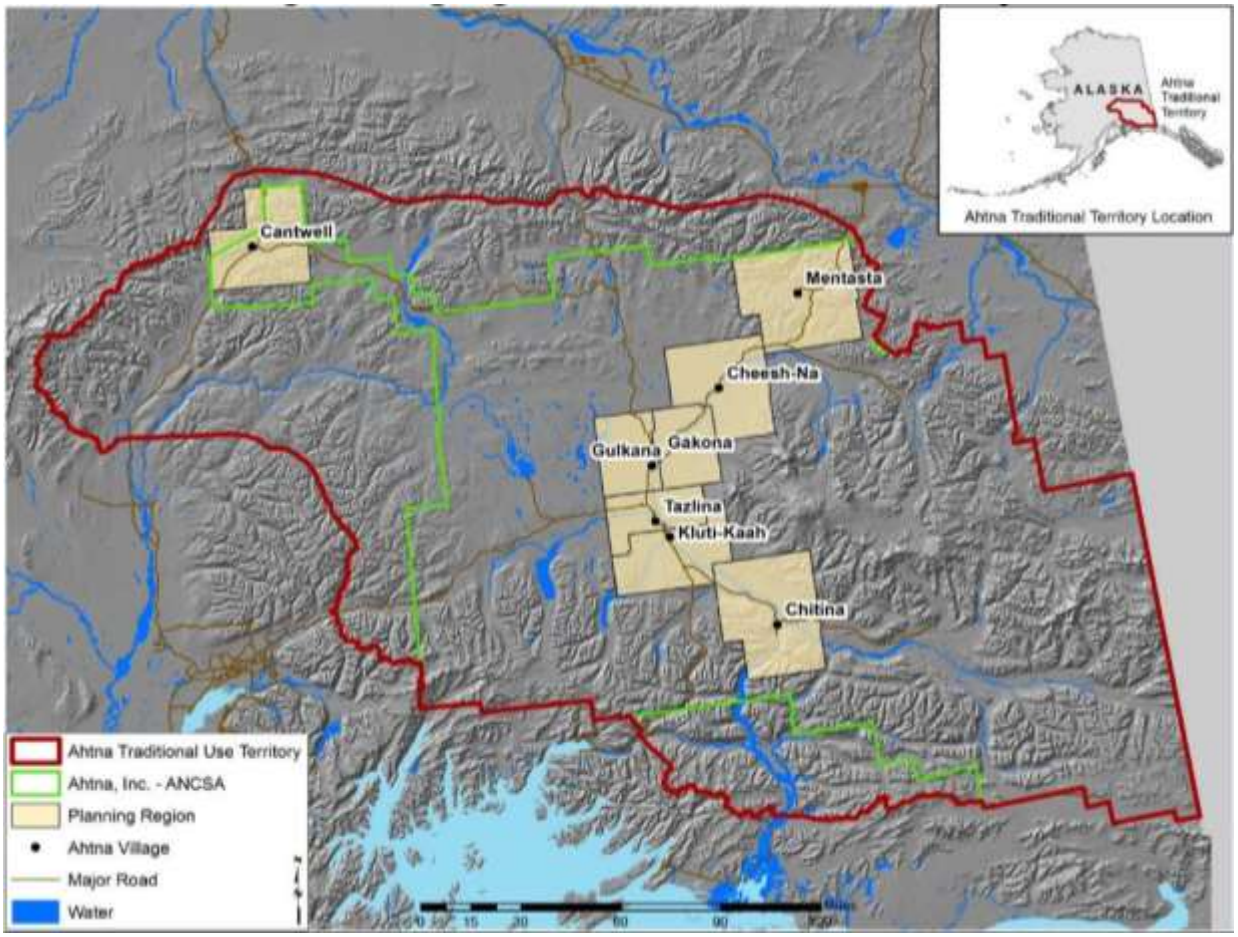

Figure 7. Tribal village planning regions within the Ahtna Traditional Use Territory.

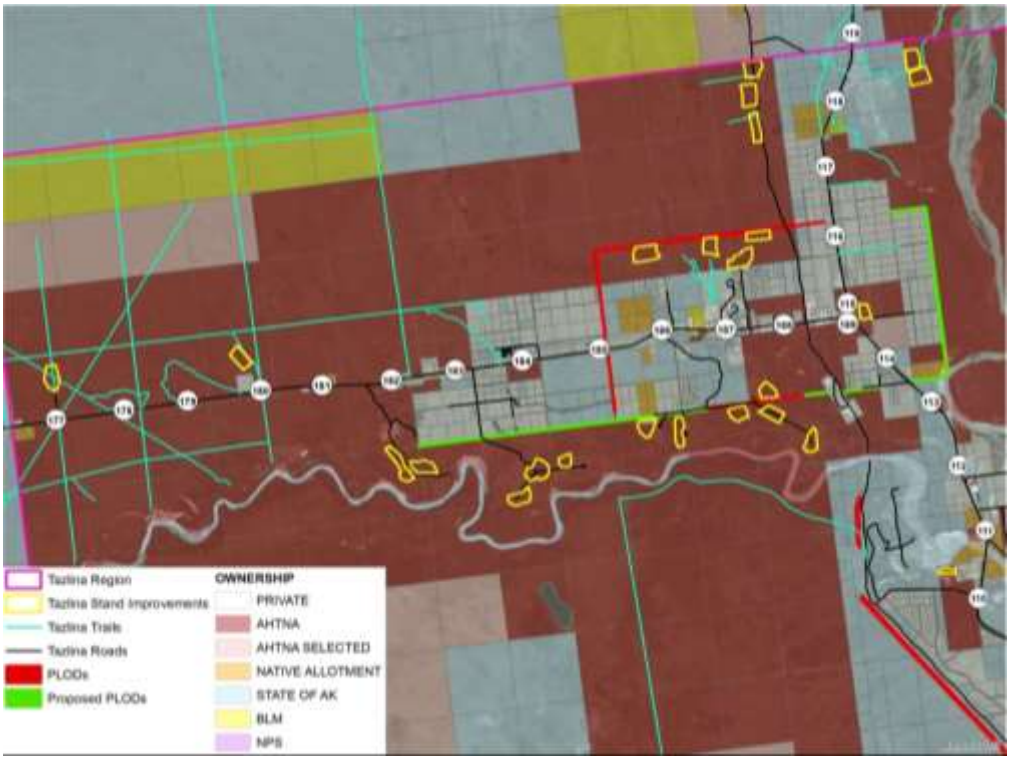

Figure 8. Proposed vegetation treatment areas and landownership within the Tazlina Planning Region.

Table 1. Vegetation treatment sites in the Tazlina Planning Region and their primary ecosystem, treatment goal, size (acres), and total biomass (tons). See Appendix A of the Final Report for ecosystem definitions.

Treatment Site Name	Ecosystem	Treatment Goal	Acres	Biomass (tons)
Ahtna Office #1	16030_C	Moose Browse	20.0	643
Airport #1	16030_C	Moose Browse	38.3	1,296
Airport #2	16030_C	Moose Browse	37.5	1,250
Fishers Pit #1	16030_C	Moose Browse	43.6	1,361
Fishers Pit #2	16030_C	Moose/Timber	35.3	1,048
North Fireline #1	16141_A	Moose Browse	26.4	316
North Fireline #2	16211_D	Moose Browse	30.8	806
North Fireline #3	16211_D	Moose Browse	48.6	651
Taz West Trails #5	16030_C	Moose Browse	34.7	1,254
Taz West Trails #6	16211_D	Moose Browse	40.6	1,007
Tazlina Fireline #1	16030_C	Moose/Timber	31.6	826
Tazlina Fireline #2	16211_D	Timber Improvement	31.0	476
Tazlina Fireline #3	16030_C	Moose Browse	30.3	1,112
Tazlina Fireline #4	16030_C	Moose/Timber	28.8	767
Tazlina Fireline #5	16030_C	Moose/Timber	29.8	942
Tazlina Fireline #6	16211_D	Moose/Timber	33.0	1,017
Tazlina Log Rd #1	16030_C	Timber Improvement	47.9	1,759
Tazlina Log Rd #2	16030_C	Moose Browse	34.4	1,367
Tazlina Log Rd #3	16030_C	Timber Improvement	18.2	647
Tazlina Pit	16030_C	Moose Browse	9.9	176
Tazlina TAPS North #1	16030_C	Moose Browse	37.3	1,282
Tazlina TAPS North #2	16030_C	Moose Browse	43.1	1,504
Tazlina TAPS North #3	16280_A	Moose Browse	32.4	205
Terrace Drive	16030_C	Timber Improvement	43.0	1,582

Landscape-level Planning

In addition to planning site treatments around each of the 8 villages, potential broader scale planning objectives were considered. The site treatments in each village had the objectives of improving moose browse production, harvesting biomass, improving stand conditions, or creating a primary line of defense from fire. All of these are envisioned to use mechanical treatments. Improvement of moose habitat from these treatments is unlikely to have any significant influence on moose populations other than to shift their distributions slightly to take advantage of areas with higher browse availability and increase opportunities for subsistence hunting by the villages. Limited amounts of biomass will be produced from these treatments, but can help to provide the villages with wood for fuel. The primary lines of defense will be a factor in community wildfire protection planning. However, when viewed from a broader landscape perspective, it is apparent that the scale of these treatments will not have significant effects on such things as improvement of moose habitat. Figure 9 provides an example of the broader landscape perspective for the proposed treatment sites in the Gakona, Gulkana, Tazlina, and Kluti-Kaah Village planning regions.

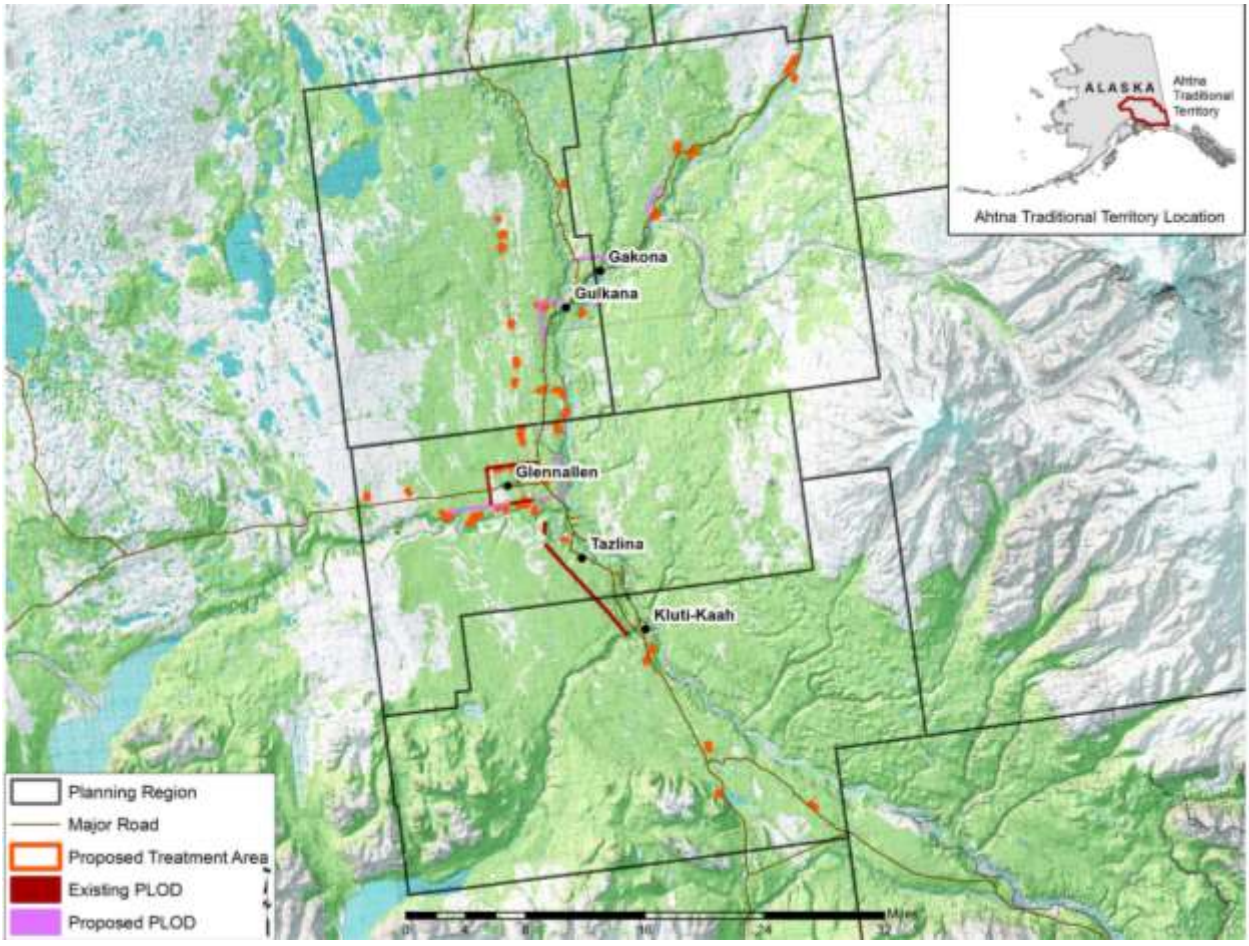

Figure 9. Map of proposed vegetation treatments areas and primary lines of defense (PLOD) for the Gakona, Gulkana, Tazlina, and Kluti-Kaah village planning areas.

At the broader landscape level, other objectives are considered. If increases in overall moose numbers are desired through habitat improvements, larger areas must be treated than those conducted at the

village planning level. Mechanical treatments can play a role by providing fuel breaks or fire management lines, but are not thought to be practical for large scale treatments. Large scale treatments will rely on either effects from wildfire managed through various fire response actions, or from use of prescribed fire. Existing fire protection designations (Figure 10) should be reviewed and adjusted if appropriate for desired future management actions.

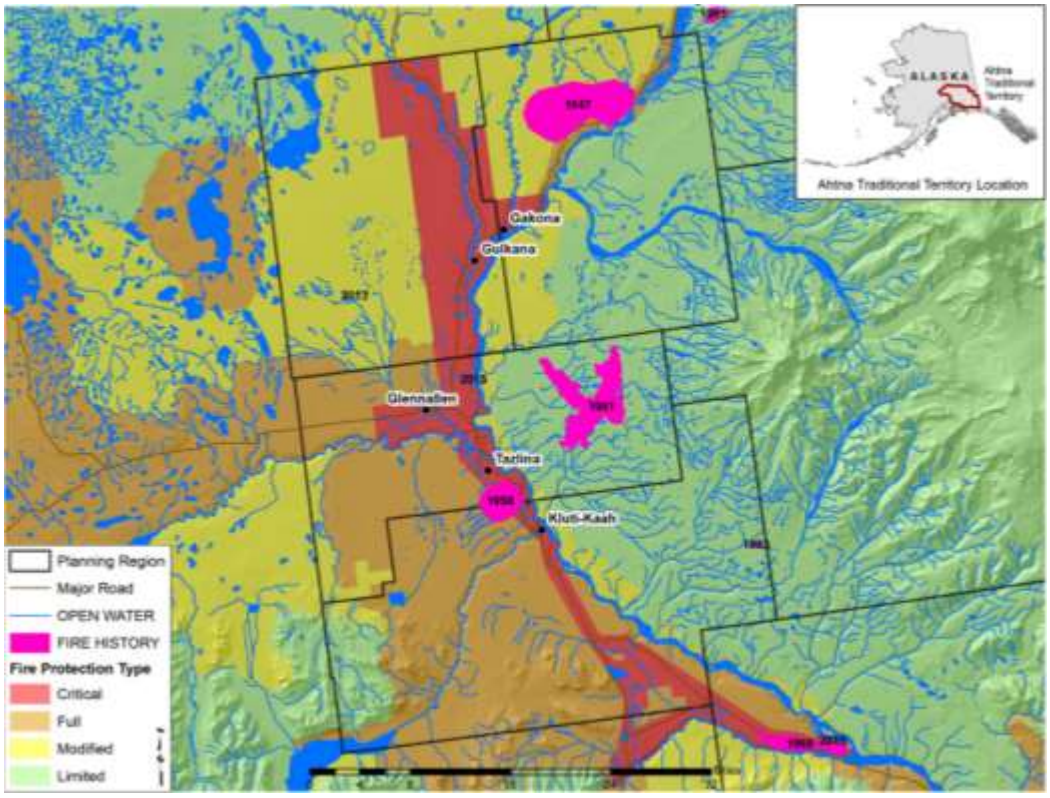

Figure 10. Current fire protection status and past fire locations in the primary Ahtna land ownership portion of the Ahtna Traditional Use Territory.

Carbon sequestration was added as an additional landscape level objective for the project in 2016. Ahtna, Inc. has entered into a carbon sequestration agreement to provide carbon offsets for the California carbon market. This means the amounts of carbon on designated lands owned by Ahtna must be managed to maintain or increase amounts of carbon into the future. Areas included in the carbon agreement are displayed in Figure 11. Immediate management objectives for these lands include high priority for full wildfire suppression actions. However, per the agreement this status will change after 2 years allowing for new management objectives for these lands.

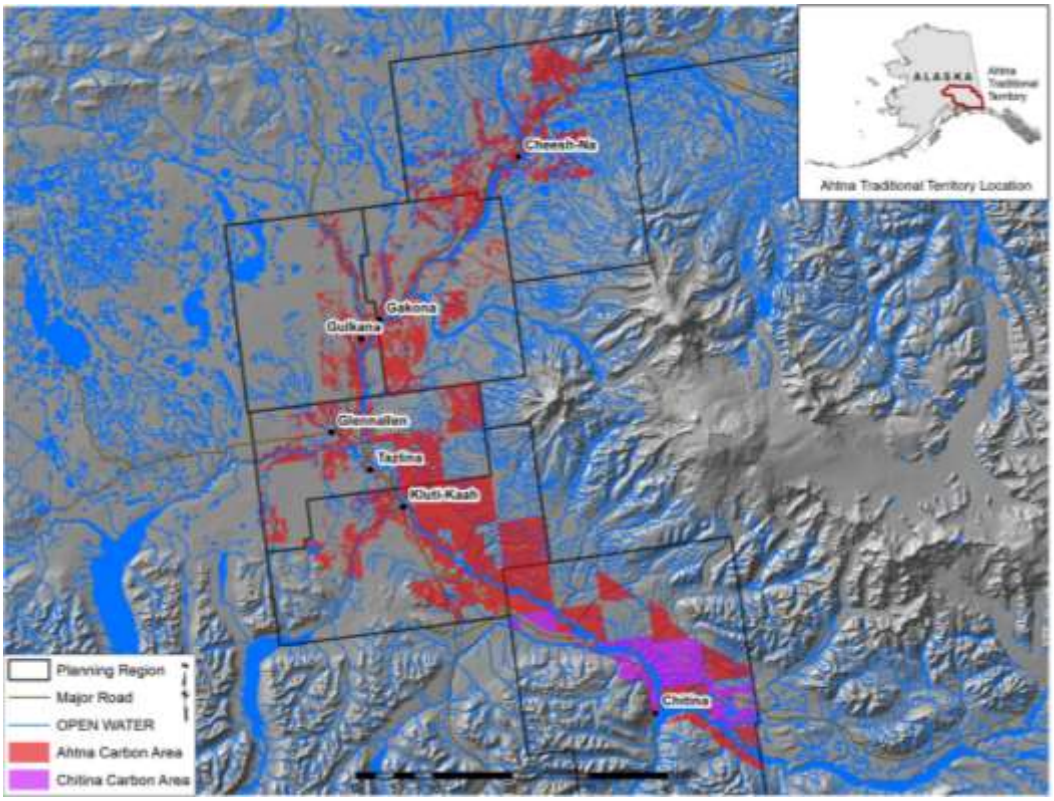

Figure 11. Current carbon sequestration areas on Ahtna and Chitina lands.

Planning at the landscape scale will require coordination and cooperation with other landowners in the region. In particular, lands adjoining Ahtna ownership such as the US Department of the Interior National Park Service, Alaska Department of Natural Resources, and the US Department of the Interior Bureau of Land Management will need to be considered. Plans may include allowing additional amounts of fire, either by letting wildfires burn or through prescribed burning. These actions would need to be coordinated with other agencies and in cooperation with Alaska Department of Natural Resources in terms of fire protection status. This project has not developed specific proposals for landscape scale planning, but has developed the tools to help conduct such planning, and has initiated such considerations through workshops with the other agencies.

One of the primary objectives of this project was to recommend ways to increase subsistence supply of moose for native villages while maintaining caribou habitat. Moose occur at relatively low densities, so efforts to increase overall population sizes requires improvements to large areas. The habitat treatments recommended for the villages will improve small patches of habitat. These can help a few moose by providing improved foraging opportunities, but will have very limited effects on overall population sizes. The primary function of these treatments is to increase harvest opportunities on existing moose populations by concentrating moose in accessible locations on Ahtna lands. To increase moose populations over larger areas will require much larger scales of treatments. This largely precludes mechanical treatments such as timber harvests or roller chopping from being effective tools except when used in conjunction with other disturbances. Primary recommended tools are selective let burn areas for wildfires and prescribed burning. Use of these tools must integrate with protection of human infrastructure, carbon sequestration goals, maintenance of caribou habitat, agreement from adjacent landowners, and economic viability.

Carbon sequestration can be compatible with moose habitat improvement and biomass harvests when properly coordinated. Some lands contain decadent stands of spruce that hold carbon in the biomass present on these sites, but are losing this carbon through tree mortality over time. Additional carbon can be sequestered by disturbing some types of sites and encouraging tree species with higher productivity and sequestration rates. In particular, those ecological sites that support productive white or black spruce or aspen hardwood sites but that are currently in late seral, decadent stands can be improved through either mechanical treatments or fire. This can not only result in greater long term carbon sequestration, but can improve moose habitat and in some locations be sources of biomass. If these areas can be targeted for a combination of mechanical treatments to produce fuel breaks or defensive lines for fire, areas can then be designated to allow wildfires to burn or for application of prescribed burning. The fire protection zones assigned to such areas should be reviewed to determine if adjustments to these zones are needed to integrate with the potential treatment zones.

Climate Change Considerations

A consideration in this planning was the potential effects of future climate change. We evaluated projected climate change for the Ahtna Traditional Use Territory. Climate projections reveal that South Central Alaska is expected to experience an increase in annual temperatures. This will be especially true in the summer months. Increases in winter temperatures are also expected as indicated by the trends in future temperatures, but the ranges in these estimated projections include potential overlap with historical temperatures. Precipitation shows trends for increases, but these are relatively small and ranges overlap with existing levels. Even if precipitation levels increase, increases in temperatures will result in greater evapotranspiration, especially in the summer, likely producing a drying effect across the landscape. Figure 12 is an example of predicted climate change for Cantwell, AK.

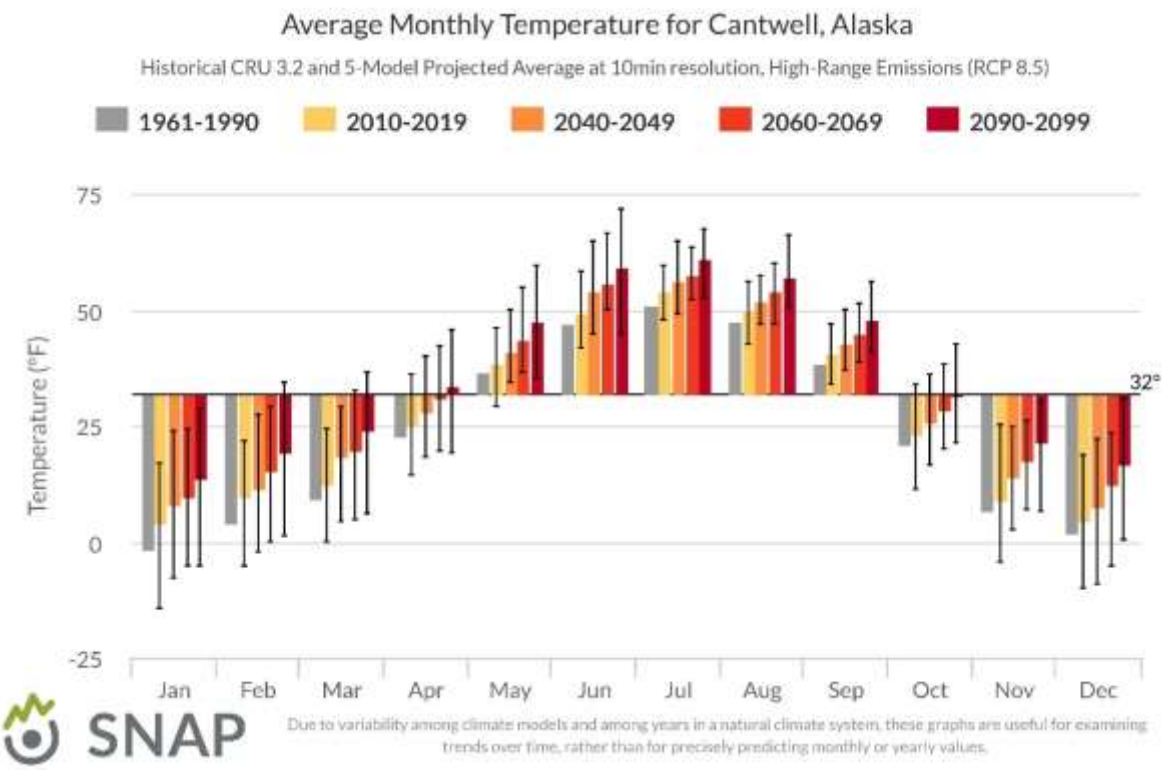

Figure 12. Average monthly temperature projections for Cantwell, Alaska, 2010-2099 (SNAP).