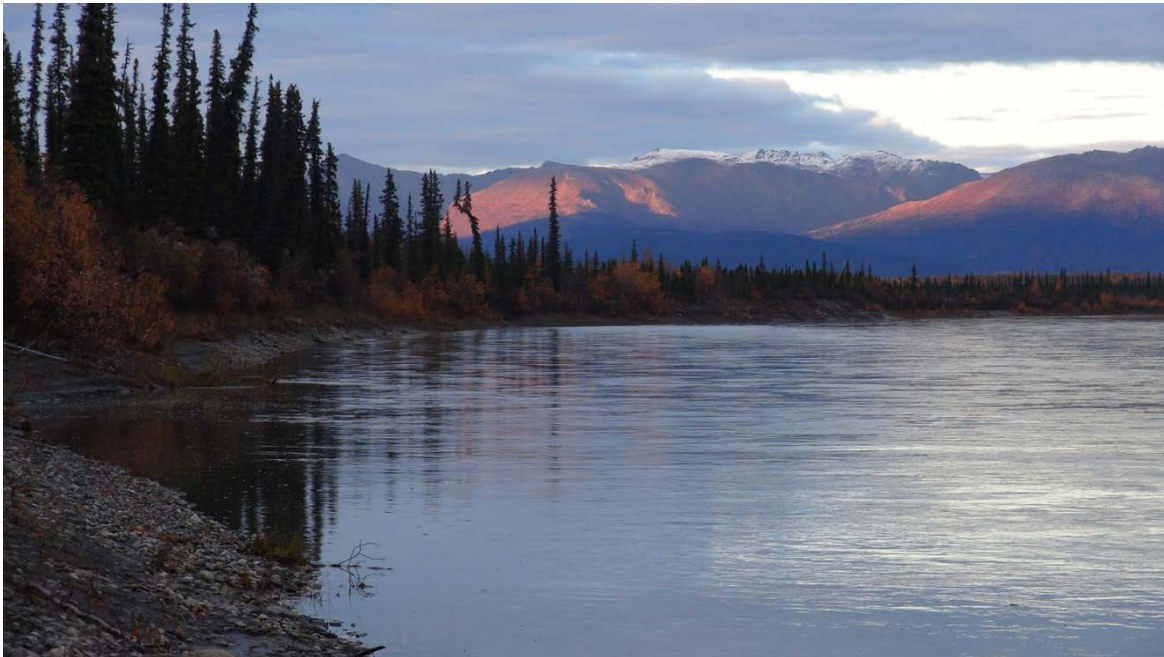


Preliminary Traditional and Local Ecological Knowledge (TEK/LEK) Study of the Impacts by the Proposed Road to Ambler on the Communities of Allakaket and Alatna

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Alatna River, facing North toward Malemute Creek and beyond to the Brooks Range, September 2012

Abstract:

The following report summarizes research completed at the request of the Alatna and Allakaket tribes, to assess the local and traditional ecological knowledge (LTK and TEK) of the area as it relates to the proposed road to the Ambler mines. This is a preliminary assessment of the potential impacts a road to the Ambler mines would have on these two communities and their subsistence. This report is not a comprehensive assessment of impacts, or the TEK of impacts, nor meant to replace the government-to-government consultations required to conduct official impact statements. Instead, this document aims to serve as a starting point to develop research for official impact statements regarding the Ambler road. The communities of Alatna and Allakaket are currently against building a road; despite being able to list some benefits, 0% of interviewees in this study were in support of a road. The report summarizes four main results: 1) Subsistence is a cultural value, a source of Koyukon and Inupiat identity, highly valued by tribal leadership in Alatna and Allakaket; 2) Subsistence is reported to be more difficult by local communities, and their food security is threatened; 3) Subsistence is an economic activity as much as capitalism is an economic activity—both can be effectively managed for a healthy way of life in Allakaket and Alatna; and 4) Interviewees perceive most potential impacts of a road to negatively affect their already-taxed subsistence regime. This report also provides guidance on developing future research questions using TEK/LTK, and offers a context through which researchers and agencies may understand the cultural and economic needs of the communities of Allakaket and Alatna.

Introduction:

The following report summarizes research done at the request of the Alatna and Allakaket tribes, to assess the local and traditional ecological knowledge (LTK/TEK) of the area as it relates to the proposed road to the Ambler mines. This research was conducted by Dr. Annette Watson, geographer of the College of Charleston, SC; Watson developed a formal research relationship with the Allakaket and Alatna tribes in 2012, after being contracted by Tanana Chiefs Conference (TCC) to complete a study for the National Park Service (NPS) of subsistence patterns and TEK/LTK of moose and climate change in Allakaket and Alatna (Watson et al 2014). In negotiations with the tribes at the commencement of that earlier research project in 2012, Watson committed to complete this additional assessment for the tribes. She alone completed this preliminary assessment pro-bono, with no additional funding from the tribes or other sources, and thus is the lone party responsible for the interpretation of the data in this report. These results were first summarized in a public presentation in Allakaket on July 25, 2014.

Traditional Ecological Knowledge (TEK) is commonly understood as a living knowledge of land, ecosystems, and land management produced through the subsistence activities of Native peoples. The cultural ecologist Fikret Berkes also called TEK a “sacred ecology” because of the distinctive worldviews that make TEK different from Western knowledge systems (Berkes 1999). And since the 1990s the field of Indigenous/Native Studies has grown to contribute to discussions of what makes TEK or Indigenous Knowledge (IK) systems distinctive from either local knowledge or Western sciences (Watson and Huntington 2014; Huntington and Watson 2012; Kawagley 2006; Cajete 2000). For example, a recent study co-authored by Watson showed how Koyukon oral tradition cannot always so neatly map out onto Western scientists’ measurements through time. The “data” from the oral tradition was not to be found in the “facts” contained in the story, but in the ethical worldview that the Koyukon elder telling the story was trying to communicate to the future generation (Watson and Huntington 2014). It is in this vein that recent scholars are arguing for the use of more inductive and “holistic” research methods that cut across knowledge traditions (e.g., Berkes and Berkes 2009); are beginning to engage with the idea of “wisdom” as different from the “knowledge” sought by Western scientific disciplines (Chapin et al 2013; Huntington and Watson 2012); and are looking toward “Indigenous frameworks” through which to contextualize Western scientific “facts” (Cochran et al 2013).

For the current study the author thereby employs a definition of TEK as overlapping with but different from LTK, or local knowledges and observations of environmental phenomena—and here reports both LTK and TEK of subsistence and the ecosystem by the people who reside in Allakaket and Alatna. Consistent with the literature cited above, this study engages TEK as a framework for contextualizing the local environmental data provided by tribal members.

This is a preliminary assessment of the potential impacts a road to the Ambler mines would have on these two communities and their subsistence. This report is not a comprehensive assessment of impacts or the TEK/LTK of impacts, nor meant to replace government-to-government relationships required by researchers and agencies while conducting official impact statements. Instead, this document aims to serve as a starting point for designing research on official impact statements regarding the Ambler road. This report summarizes community knowledge and expert opinions regarding the potential road impacts, provides guidance on how to develop research questions using TEK/LTK, and offers a context through which researchers and agencies may understand the cultural and economic needs of the communities of Allakaket and Alatna.

Methods:

The sources for data in this study include over 10 years of ethnographic fieldwork conducted by Watson throughout the villages of the Koyukuk and Yukon River drainages, using the techniques of participant-observation, archival research, and digital video documentation methods (Watson and Till 2009). Much of the data specific to the tribes of Allakaket and Alatna had been acquired from a study performed by Watson for TCC, on the TEK/LTK of moose and climate change; the inductive methods for that data collection are carefully outlined in a report for the National Park Service (NPS) (Watson et al 2014). The data collected in that project, further analyzed for this report, includes: 37 semi-structured interviews; visual ethnographic materials and field notes collected during multiple fieldwork visits over two years; archival research; and spatial data for GIS analysis. But while Watson collected data for that project, she also collected additional data for this present report from the interviews. The interview questions were all designed to elicit both the interviewee's subsistence patterns—with interviewees drawing on maps or talking about where they and their family practices subsistence—as well as their understandings of moose ecology. But at the end of each semi-structured interview with residents of Alatna and Allakaket, the tribes asked that Watson include an additional topic and questions for analysis in the present study:

**How do you think subsistence could be impacted if a road were to be built to the Ambler mines?
What might be the effects on your community? Are you in favor of a road?**

It should be noted that the sampling strategy for conducting these interviews was designed to be appropriate to the task of collecting TEK and LTK. Researchers did not conduct a total or random sample of village residents—not everyone in the communities are “experts,” defined here as active hunters or respected culture-bearers. A random sample would have produced as much “noise” as would a random sample of the American public asked about scientific knowledge. A purposive sampling strategy was therefore employed: researchers asked tribal leaders and the administration in each tribe to identify people who could *best* represent TEK and LTK for Alatna and Allakaket: elders and the most active hunters. The resulting sample of interviewees, identical to Watson et al 2014, is shown in Figure 1.

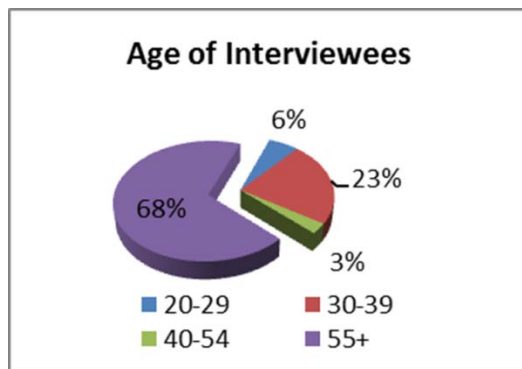


Figure 1: Age of interview sample; n=37

A total of 35 interviews were recorded with 37 people, capturing over 78% of households in Alatna and 39% of households in Allakaket. As noted in recent ADF&G studies from the Subsistence Division, although 100% of households in both communities rely on subsistence resources, fewer households actually procure subsistence resources (particularly moose), consistent with the typical sharing and trading practices of most Native cultures and their subsistence economies (Holen et al 2012). Thus the

present study employed the most rigorous procedure to capture the local and traditional knowledge of the ecosystem and subsistence practices by the recognized practitioner-experts in these two communities.

Once data was collected, GIS analysis of subsistence patterns could begin, using a procedure outlined in Watson et al 2014. Interviews were transcribed, and for the present study, the data was further coded (Cope 2009) to elicit the pattern of community knowledge and opinions about potential impacts of the Ambler road. In July 2013 Watson returned to Allakaket and Alatna to discuss and obtain feedback about the results of both the TCC study on subsistence activities and this present study—and incorporated that feedback into both written products, according to best practices in participatory methodologies (Chilvers 2009; Watson and Till 2009). At that public meeting Watson also worked collaboratively with the participants to produce a video (Garrett 2010; Hall 2009) that represents the tribal members' discussion of the tradeoffs and challenges that a road would bring. This research process at the public community meeting allowed additional residents to contribute to the study beyond the expert-interviewees, and greater understanding about the community scale perspective was achieved. It should be noted that tribal support of the conclusions in this report is indicated through the tribes' request that Watson present these results and video at their July 2014 meeting to discuss the potential road to Ambler; she was asked to be the first presenter for the day, and to summarize the reasons for the communities' opposition to the road for the audience of agencies and industry personnel.

Results

The communities of Alatna and Allakaket have expressed steadfast opposition to building the road to the Ambler mines; despite being able to list some benefits for a road, 0% of the people interviewed in this study were in full support of a road. This section outlines the reasons why these communities do not support the road. These results are significant for designing research for future EIS or cultural impact statements regarding development activities; these results also are germane to planning efforts in the communities of Allakaket and Alatna whether or not a road is built.

1: Subsistence is a cultural value, a source of Koyukon and Inupiat identity in Allakaket and Alatna

The participant-observation and interview data showed that the leadership and TEK/LTK experts in Alatna and Allakaket highly value subsistence as an activity, and responses suggest that the act of subsistence is a source of Native identity. It is not the only source, but the interview data suggests it is a primary source of both individual and community identity. As noted by one of the interviewees:

“My grandparents raised me up and all they had all native food. And so I like to eat meat all the time you know. And my grandchildren, I got what about eight of them around here now, they like uh, like moose meat soup too, you know. They come here all the time because their grandmother make big pot of soup you know. I, I just like, I like to eat native, native foods you know. I have to really, that's all it is for me.”

Subsistence is **not** understood as an “outmoded” way of life, something in the “past,” or an effect of an “undeveloped” economy. Instead, subsistence is understood as part of an ongoing spiritual/religious and economic practice. Asked how important subsistence was to their family, 100% of the interviewees reported that it was very important, and would often emphasize this point:

“Very important. Very important. Cause that's what we eat, most of the winters, moose and um ducks and geese. My husband, he brings a lot of ducks and geese home in the springtime and we have to save it for throughout the winter too. So, ducks and geese and moose. Um caribou if it's close enough that we, that the guys can get it, then caribou. That's really, yeah that's a treat to us. (Laugh).”

The analysis from Watson et al 2014 articulated that overall, the people of Allakaket and Alatna today express the same spiritual connection to the land and animals as had been shown in prior studies of the local area (Nelson et al 1982). This is despite changes in the ecosystem and in the cash economy, which have affected the particular species hunted. For example, people do not trap or hunt small game like hares as much as they used to; there are also fewer muskrat and less demand for furs. But the research shows that these societies have endured many such changes in the ecosystem and economy: indeed, scholars note that the people from Allakaket are descended from families who subsisted in the area even before the boreal forest regime dominated the landscape 7000 years ago (Chapin et al 2010; Arundale et al 1989; Arundale and Jones 1989). As described in Watson 2014 and other studies by the Subsistence Division of ADF&G (e.g, Holen et al 2012), since the 1930s the communities of Alatna and Allakaket have developed a greater reliance on moose corresponding to the decline of the use of other species, but especially because of the decreasing availability of caribou and King salmon. Yet the Watson et al 2014 study showed that, despite such changes, across both Alatna and Allakaket was a continuity of beliefs in the activity of subsistence as a cultural value, as part of a healthy economy, and as essential to a healthy way of life.

Subsistence is thus not defined by the types of species a community currently relies upon, but the relationships cultivated through the continual acts of hunting/fishing/gathering—and adapting to that changing ecosystem. The relationships created through a subsistence economy contribute to both an individual's and community's enduring identity—even if the particulars of the practice might adapt to the ecological and social context from year to year or generation to generation.

Subsistence is therefore not practiced because of a “lack” of opportunity in a capitalist system, but is seen as a pathway to take care of one's extended family, including the game and fishes and other biota from the land that feed their people. Indeed, all human and non-human relations make up the identities shared in Alatna and Allakaket; the same purposes and meanings of subsistence are found throughout the academic literature for Native communities, in Alaska as well as internationally. For example, as documented in Watson and Huntington (2008), Native hunters do not really think *like* an animal, as much as they are thinking *as* an animal would think—they share their identities with animals to “know” them. This is a very different approach to knowing animals compared with the methods of wildlife biology—using TEK, a hunter can find success if they *become* the animals they seek. Similar ideas emerged in interviews in Allakaket and Alatna:

“When I go around sometimes if I'm just scouting around in the woods, if I want a certain animal I kinda, I just think like animal. Think like, ‘where would I want to make a den or where would I wanna look for food?’ I thought about that and I thought about that and uh, if I was a bear, when I'm out there, I'm looking for bear den sometimes. And uh when I get a chance, if I'm not doing something else, I think, ‘Where would I want to make a den on a hillside?’ I'd look for a lot of grass and uh leaves, what a bear would use inside of its den. It's like uh, I don't know, it's like a hide and seek. I try to think like—you can't think *like* bear—but if I *was* a bear I'd want a den where nobody would find me. So I'll look around on little banks or high ground. Where I know there's mud and where would I want to make my den.”

Because hunters share their identities with these animals in the act of subsistence, they are able to intimately understand animal behaviors—and this assists a hunter in procuring a subsistence opportunity. All subsistence practices by Alaska Natives are both shaped by and shaping this worldview; Native arts, stories, and dance often reflect this idea of a transformation between being human and being animal. As described in current academic literature, these should not be interpreted as cultural artifacts, or describing a one-time transformation to become human. The transformations happen as part of the human-nonhuman relationship, in cycles, in seasons, in portions of one's day, and part of the rituals and practices required to know and live within the local ecosystem (Huntington and Watson 2012; Watson and Huntington 2008; Kawagley 2006; Cajete 2000).

Subsistence is not only a core activity that affirms Native identities, as interviewees also indicated that subsistence—and teaching children subsistence practices—was an essential way to deal with the risks of living in rural areas and the instabilities of global capitalism:

“To me, right when I was growing up it was always subsistence, meat and fish and berries, and a lot of wood. It's very important right now....If we got cut off from society, there's a, we don't have stores with food, or it's really cold, planes can't fly. We should have some meat and fish in our smokehouse to go, and we could survive. ...Without that um we would be poor.”

As articulated in the report by Watson et al 2014, the residents of Allakaket and Alatna have been shown to adapt to changing ecological and social conditions in ways that maintain their subsistence-based livelihoods. They have developed as a part of the “social-ecological system” of this changing boreal forest—to the point where environmental scientists have suggested that Athabascans have “co-evolved” with the boreal forest (Chapin et al 2010). And it is their continued commitment to subsistence that has allowed these people to learn and share so much of their knowledge about the land, and thus about these changing ecosystems; subsistence users are valuable knowledge-holders about the environment. As reported in the Watson et al 2014 study, the subsistence users in Allakaket and Alatna indicated that changes in hydrology brought about by permafrost melting is negatively affecting moose habitat and making moose more vulnerable to non-human predators. The role of subsistence users in informing future environmental management and adaptation strategies therefore must also be underscored.

2: Subsistence is reported to be more difficult by the local communities, and their food security is threatened

Interviewees spoke not just about how important subsistence was to them as an activity, but also as a source of traditional food for consumption. The people of Alatna and Allakaket prefer subsistence or “traditional foods” over non-traditional foods, the latter defined as created via industrialized food production. As noted by one interviewee,

“And then if we don't uh get our subsistence food it just seems like you know not eating right. Then we get quick tempered and all that. [Laugh.] Bloated! Like, like I am now, cause I just went on 10-day trip and put on about 12 pounds you know just eating, eating the food from restaurant.”

The Watson et al 2014 study examined subsistence patterns by residents of Allakaket and Alatna, asking interviewees to draw on maps and talk about where they practiced subsistence on a regular basis, or “usually.” In consultations with the tribes during the mapping process, leaders pointed out that they did

not want maps of their subsistence to represent one particular year, often called a “baseline” study—because they wanted to best reflect the necessary practice of being opportunistic and adapting to local conditions. For example, in a high water year people can travel more—especially throughout the Kanuti National Wildlife Refuge (NWR), where water is usually low—but such access is not typical.

Yet opportunism is an essential strategy to survive on the land—to survive the vicissitudes of a season, as well as to survive longer scale changes in climate and ecosystem. Thus many Native peoples are taught to “accept” any animal that “gives itself” to you (Watson and Huntington 2008; Wishart 2004). This practice of opportunism by Allakaket and Alatna subsistence users was captured in project maps through procedures that created a three-mile buffer area around and connecting the primary places where interviewees reported they “usually” practiced subsistence (for detailed methods of the GIS analysis, see Watson et al 2014).

Researchers report that the GIS analysis of that information yielded a pattern of subsistence that represents approximately the last 30 years of subsistence (Watson et al 2014), and the following maps are taken from that report. Figure 2 shows the overall pattern where the most active hunters and gatherers practice their subsistence; the more opaque areas indicate areas of greater use, thus showing how the Alatna River and the stretch of the Koyukuk River toward Bettles and the Dalton Highway are areas of greatest importance to subsistence by these communities.

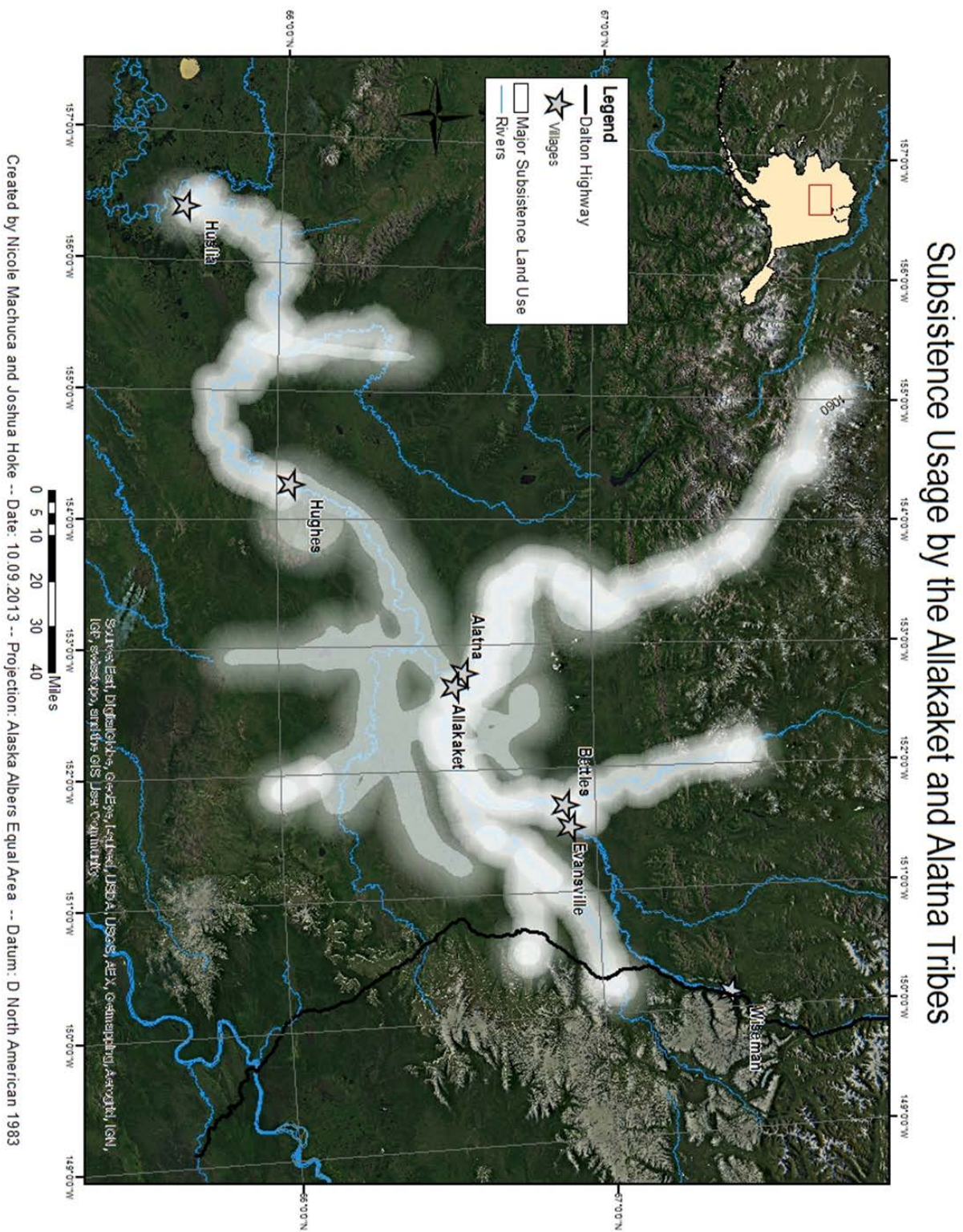


Figure 2 (from Watson et al 2014)

Figure 3 shows the overlapping land management boundaries, displaying how subsistence use by Allakaket and Alatna residents stretches far north into Gates of the Arctic National Park via the Alatna River. Significantly, the subsistence pattern demonstrates how the communities would feel they are the legitimate land managers of the area, regardless of who is the legal land “owner” on a given plot. For if subsistence is about “taking care” of the land, and TEK guides people to share their identities with the creatures they harvest, then this subsistence pattern shows the areas where people have a very strong connection to the environment, and the places where they feel the greatest sense of responsibility. Indeed, Figure 4 shows how the areas of greatest subsistence use are also areas extensively named by Koyukon and Inupiat peoples in their native language. The data for this layer comes from a project by the US Fish and Wildlife Service (USFWS) and the Yukon River Drainage Fisheries Association (YRDFA), initially published in the *Middle Koyukuk River of Alaska: An Atlas of Fishing Places and Traditional Place Names* (YRDFA 2009).

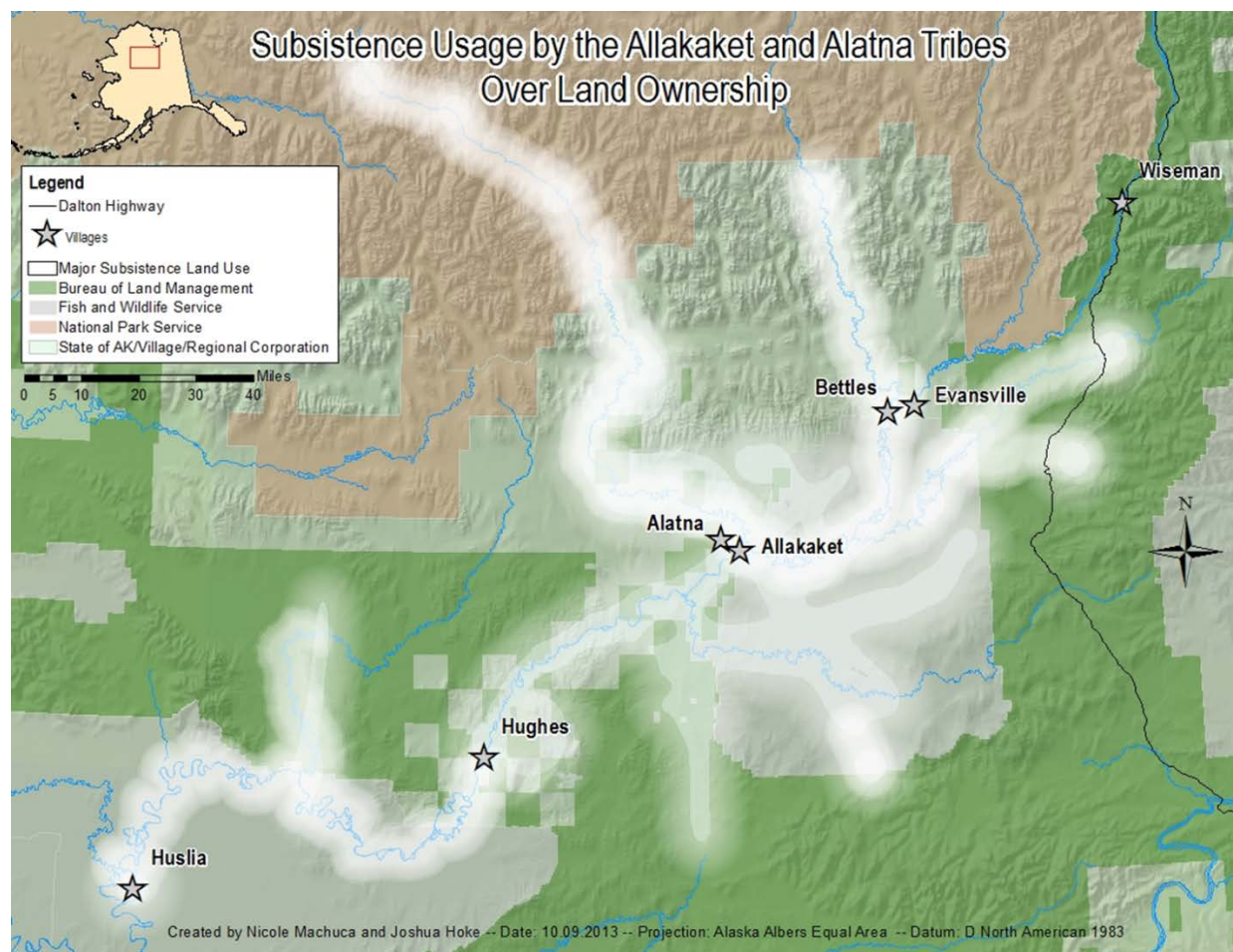


Figure 3 (from Watson et al 2014)

Subsistence Usage of the Allakaket and Alatna Tribes along the Kanuti River

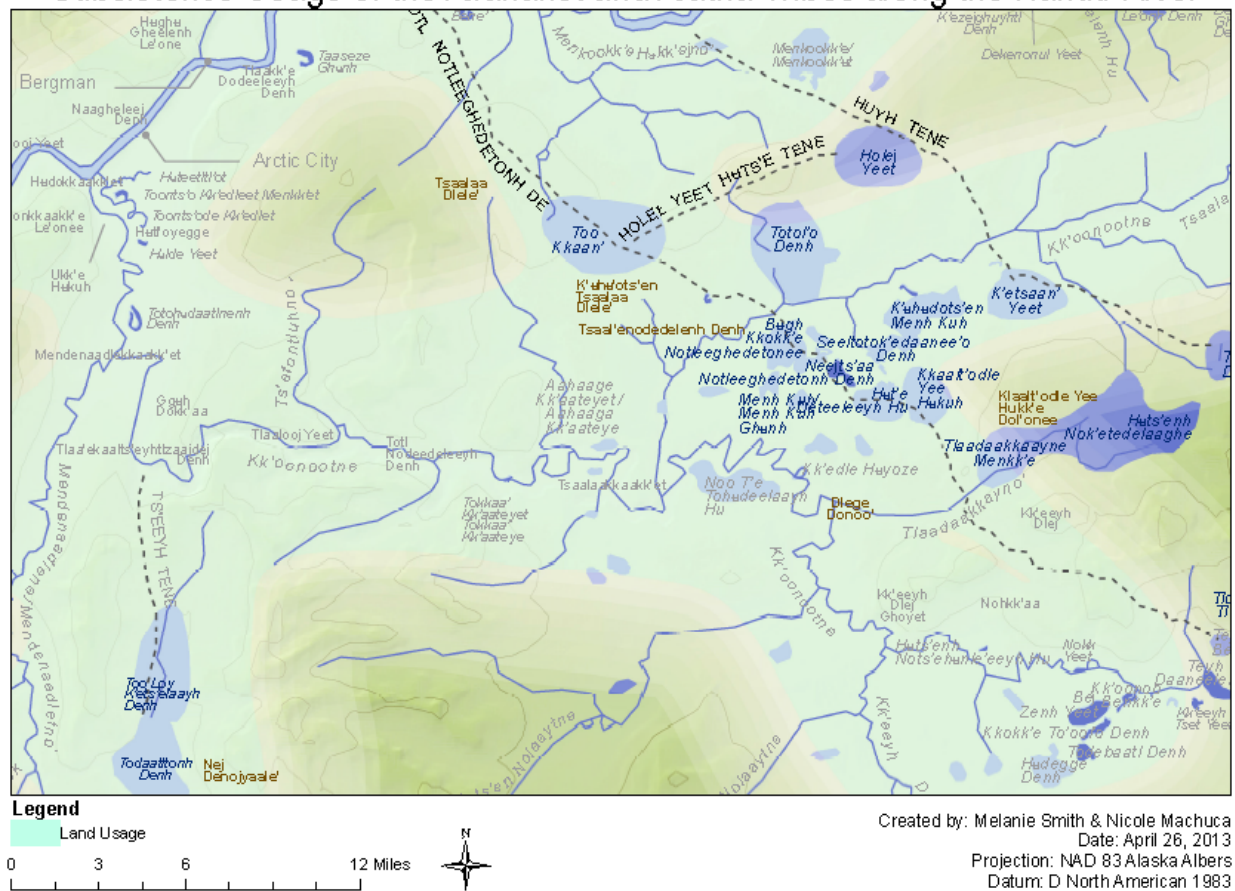


Figure 4 (from Watson et al 2014)

Figure 5 shows this subsistence pattern over the recorded forest diversity in the area. Something notable from this pattern, beyond showing human travel on the major rivers, is how subsistence is concentrated in areas where the forests are most diverse. While some might interpret this correspondence to hunters seeking out places where the forest is most diverse, according to TEK, this diversity is sometimes caused by “taking care” of the land (Watson et al 2014). For example, some interviewees said the decline of the trapping economy happened *before* the decline of these animals that were trapped. This expression of hunting/trapping as productive of game is common across all Koyukuk River communities, and often is an expression of the belief in the human role as actors in the ecosystem. Trappers took the “extra” beavers out of the system so they did not reach a carrying capacity by, as one of the interviewees stated, “eating up all the willows and stuff, you know there so many of them.” The subsistence users in this area are aware of and contribute to ecosystem dynamics—including ecosystem diversity.

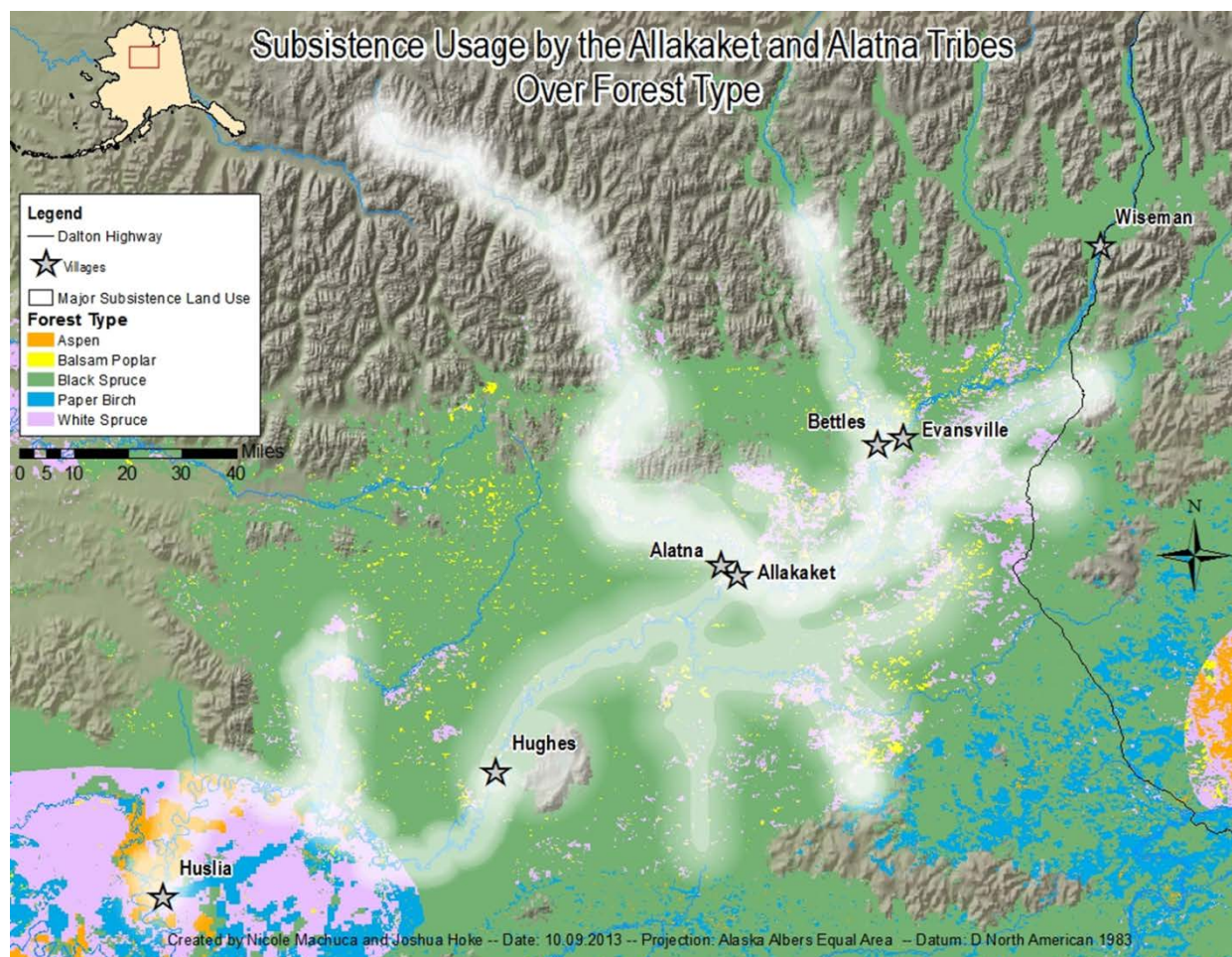


Figure 5 (from Watson et al 2014)

When compared with a prior baseline study by Marcotte and Haynes (1985), what is immediately apparent from these maps is that the area in which people recorded subsistence use has grown southward past Hughes and to the Hogatza River and Huslia, whereas all other areas of subsistence have remained relatively stable. Watson et al 2014 reported that this growth represents adaptations to moose availability in the fall hunting season, and concluded that the communities have had to become mobile to obtain their food resources—to areas where moose are more plentiful.

As noted also by Holen et al 2012, the communities of Alatna and Allakaket have developed an increasing dependence on moose for their food security, especially because of decreases in other resources. Indeed, many interviewees reported that, although many families used to rely on caribou long ago, caribou and King salmon had declined in their area, making moose hunting more essential.

Many causally related the decline of caribou to the construction of the Alaska Pipeline and Dalton Highway; many said that all kinds of impacts from development affect the ecology of Alatna and Allakaket, and thus their own abilities to subsist. Some interviewees talked about how events like the Exxon Valdez and the Gulf Oil Spill have influenced both migrations and abundance of bird populations, while others spoke about how the construction of the Dalton Highway created difficulties for locals competing with more non-local hunters.

The Holen et al 2012 study by ADF&G Subsistence Division also reported that these two communities consistently expend the most time and effort procuring moose, and 100% of the households use moose in their diets. Whereas Alaska Native villages rank higher than the US national average for food security, the villages of Alatna and Allakaket are the exceptions; Holen et al 2012 report that these two villages rank the *lowest* when it comes to food security, measured against other Alaska Native villages and nationally.

But again, the people interviewed for this study suggested that the solutions for food insecurity are not to be found with increasing access to non-traditional foods. As noted above, most interviewees believe that subsistence foods are the healthiest options for an individual's regular diet. Additionally, interviewees were ambivalent about public assistance for food via the "Quest Card": while some said that welfare became necessary at times, others expressed dissatisfaction about the quality of the foods purchased through the Quest Card program, saying also that the money does not go very far. Others noted that when ammunition was allowed to be purchased using the Quest Card it was more beneficial than how the program operates today, and some complain that the program is incentivizing dependency and avoiding subsistence labor. Most significantly, subsistence or "traditional" foods are seen as a far healthier option than any foods produced via industrialized agriculture.

Overall, the results suggest that communities would prefer to cultivate their subsistence economies for their physical health and spiritual well-being.

3: Subsistence is an economic activity as much as capitalism is an economic activity—both can be effectively managed for a healthy way of life in Allakaket and Alatna

Indeed, rather than see subsistence as exclusively a cultural phenomenon (a "way of life"), the results of this study indicate that subsistence must be understood as an economic means to a "good life." Statistics such as unemployment rates and income do not reflect how the Inupiat and Koyukon peoples of these villages want to measure the entirety of their livelihoods or their happiness for future economic planning. Just like a capitalist economy, a subsistence economy is provisioning—and interviewees report a complex hybrid of subsistence/cash resources that afford them a good life. Overall, people see that the "mixed" economic system benefits their families and community goals—and welcome some opportunities brought by capitalist endeavors—but they also report complicated trade-offs between the two economic systems.

For example, individuals and families must carefully choose how to use their time, either to earn cash or to practice hunting/fishing/gathering. "Going out firefighting," or participating in a "9-to-5" job means less time for direct subsistence opportunities, whether hunting/gathering or processing subsistence resources. Similarly, just as the dedication to educate their youth in the K-12 system will make graduates more competitive for jobs in the capitalist economy, interviewees remark that kids seem less educated in the subsistence economy and in general safety in the woods. Interviewees for example described how the education of students in the subsistence economy is left to the actions of volunteers relying on donated gas to take out the youth; yet training youth in subsistence skills is of great importance to all the interviewees.

When discussing the relationship between the subsistence and cash economy, interviewees noted that people make economic choices based on the opportunities afforded to them; therefore, when capitalist opportunities are incentivized when subsistence opportunities are not, these benefits can be at the expense of subsistence opportunities. This attitude informed interviewees' discussion of the "Quest

Card,” which was seen as necessary assistance for some families, but dis-incentivizing subsistence activities, especially because the benefits could no longer be used to purchase ammunition.

Choosing to partake in capitalist-based activities over subsistence activities thus should *not* be mistaken as a *preference for* being fully integrated in a cash-only economy. Interviewees and participants at the public community meetings expressed preference to rely on subsistence as a means for provisioning their families and larger community—and spoke extensively about how certain development endeavors that benefitted the capitalist economy, such as the Pipeline, negatively impacted their local subsistence opportunities. Interviewees reported that much of the decline in their subsistence resources were the result of large-scale development activities and events such as the Gulf Oil Spill, and the solutions they offered were always to increase subsistence opportunities, not to supplant the subsistence economy with capitalist opportunities. The interviewees indicated that they had already sacrificed enough of their subsistence opportunity for larger-scale capitalist development.

Given that a road would cross some of the areas most crucial to subsistence for the families of Allakaket and Alatna, the potential road to Ambler would undoubtedly impact subsistence opportunity. However, these ways are as yet unstudied and unmeasured, and the respondents are basing their own analysis on not knowing the possible benefits as well as exact costs that a road could have on their own subsistence.

4: Interviewees perceive most potential impacts of a road to Ambler to negatively affect their already-taxed subsistence regime

This section summarizes interviewee responses to the questions about the potential impacts of a road to Ambler. It should be noted that this is a summary of the local expert opinion, thus this summary should be used to guide future studies to quantitatively measure the potential impacts of road development.

Significantly, 100% of interviewees from this study said that, given their current assessment of the tradeoffs associated with a road to Ambler, they would *not* support road development. Interviewees discussed a variety of positive impacts a road could provide for their communities, such as cheaper gasoline and goods, and some short-term employment. Yet these benefits were often discussed in ways that made them unfavorable changes overall, such as the potential employment being service-oriented and not well-paying, and that the goods the community would have better access to includes those goods that are bootlegged. Even the discussion of having a benefit of cheaper gas was undercut by the belief that locals would have to use more gas to compete with non-local hunters, who will have increased subsistence opportunity at their expense.

Indeed, some of the greatest potential impacts discussed by interviewees involve the impacts created by non-locals, whether they are hunters or a recreationalist who might drive the road. With a road, interviewees described how they would have to compete for the local resources with people from “outside” the immediate ecosystem—within a system where the local communities are already reported to be food insecure. While many discussed how a private road may be a way to limit access, others described how promises of limited access roads were already promises not kept by the State of Alaska, and assume that “outside” hunters cannot be stopped.

Another related concern from the interviewees was how road development could negatively impact ecosystem processes such as caribou migration—and thus further negatively impact the communities’ access to this subsistence resource. Others note the potential of polluting activities, whether during or

after road construction, which could cause serious harm to local fisheries—the Alatna River in particular was underscored as hosting important chum salmon and whitefish reproductive habitat.

When prompted to think long-term about the effects on their community, this group of interviewees, experts on subsistence, listed only drawbacks. Many described how the employment opportunities would not be well paid, and this would negatively impact subsistence opportunity. Again, the choice to practice subsistence is certainly about cultural wants and needs, but also involves economic incentives: a low-wage earner might need to work too many hours or jobs to afford the time to practice subsistence, or a low-wage earner (or family) might not afford the price of subsistence in terms of gas and vehicle expenses. One interviewee described how their people were “not ready for a road” in terms of job training, and thus might only “make the beds” or provide other low-skill and thus low-paid service. Given this vision of the future, the sacrifices to subsistence opportunity did not seem worth it to these interviewees.

The second major long-term drawback the interviewees discussed was also the overall decrease of opportunity in the subsistence economy, which would negatively impact their spiritual and physical well-being.

Discussion

It should be noted that some of this negative analysis and opinion has a lot to do with the early process of road planning that has left out the tribes of Allakaket and Alatna. Neither tribe was ever approached formally about the plans to examine the potential route by any agency of the State of Alaska, yet tribal members witnessed plans going forward on the lands they felt responsible toward.

For example, when Watson commenced working with the tribes in 2012, leaders identified a “new thing set up” along the Alatna River, and took her to the site (Figure 6). Watson inquired via the contact information provided on the equipment, and informed the UAF researcher that the tribes expressed concern that they were not approached about the placement of the devices, or informed about the purposes of such devices. The reply summarized the kinds of data collected by the “Alatna River Gauge Site,” and after some research on the UAF faculty website, Watson informed the tribes that the UAF researcher leading the data collection worked in the field of civil engineering. Watson also noted that the selection of such gauge sites was not innocent—if it were, these gauge sites would have been randomly placed throughout the state. Instead, gauge sites have been located in areas where oil and gas development and contemporary mining activities are also most concentrated in the state; Watson suggested to the tribes that the gauge site would be used by the state in assessing environmental conditions for a road, but hoped that the researchers would themselves contact the tribes to answer any questions.



Figure 6: Alatna River Gauge Site

Subsequent to the exchange with the UAF researcher, the tribes were never contacted formally about the data collection; Watson was asked by the tribes to map the location of the gauge site in comparison to where locals practice their subsistence, and confirmed that it was sited in one of their primary areas of importance (Figure 7).

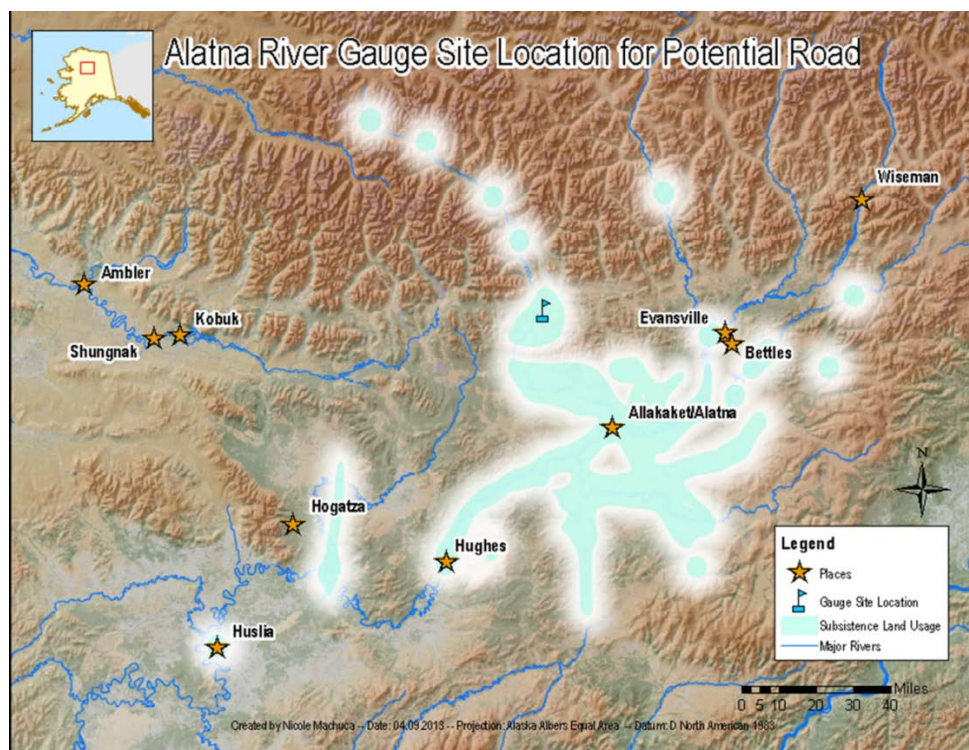


Figure 7

Throughout all of the discussions regarding the road, interviewees and tribal leaders of Alatna and Allakaket expressed concern over their apparent lack of political power and sovereignty. Some noted that the issue touches deeper tensions between Athabascan and Inuit groups that pre-date contact with non-Natives; some note the risks of the road are borne primarily by the Interior tribes, and not by those who might receive the greatest benefits for the project. In these ways tribal members expressed a sense of injustice over the project, and many contend that the local communities need to have a greater political say in their economic future.

Recommendations

In the first place, future impact statements must recognize that a new road will have impacts on subsistence, and therefore on the identities of residents from Allakaket and Alatna. Any impact statement must recognize that what is being altered with road-building is not just ecosystems, but social-ecological systems—human communities and individual identities and practices will change, along with the ecosystem.

Change does happen—as noted, the families from Allakaket are descended from peoples who have adapted to the changes to the boreal ecosystem that currently characterizes the area. Native peoples have seen a lot of changes, especially in the last 400 years, and they have adapted and continue to adapt to these changes (Huntington and Watson 2012). For example, the climate is changing the local social-ecological system, as indicated in the Watson et al 2014 study of Allakaket and Alatna. But the changes brought about through development activities in the State of Alaska are the kinds of changes that the residents believe they should have more control over—building a road is a human choice, a political choice. Thus any chosen change that could subsequently change their identities is not to be taken lightly, without transparently considering the tradeoffs, both positive and negative, that come with these potential changes to the daily practices that help constitute one's identity.

Thus a primary recommendation is that future studies and planning endeavors should be designed collaboratively with local villages such as Allakaket and Alatna as the focal scale, and as participants in the research and planning process—in accordance with formal community research praxis. In other words, studies and plans need to be tailored to address specific contexts and goals of the local villages, achieved by forming research questions collaboratively, and engaging scales of analysis that are made meaningful to local planning. Whether or not a road is built, local communities need to be engaged in the shaping of their futures.

These tribes need to be more directly involved in the research and planning that would affect their future not just because these tribes exist, but because they are existing managers of the ecosystem, with intimate knowledge of landscape change both past and present. These communities have expertise that will be important to consider, especially given the changes in climate that are likely to transform boreal ecosystems radically in the near future (Chapin et al 2010). Whether it be an engineering study or to understand wildlife dynamics, there are experts on the local environment that could contribute to any impact study or changes in social-ecological systems. Relatedly, it is also the recommendation that funding needs to be provided to forge good working relationships between local tribes and researchers; experts are not to be treated as volunteers, and need to be appropriately compensated for their time to participate in studies (Miraglia 1998). Tribes also need improved fiscal capacity to administer these

working relationships, and the budgets for impact assessments need to provide for local administrative expenses (such as formal reviews of studies, as well as for assisting research leads in data-gathering stages of work).

Research (and outreach) needs to be specifically designed to address local-scale issues, and funds need to be provided for planning efforts in those villages most affected by a road. In the case of Alatna and Allakaket, two of many villages that will be impacted by a road, this report outlines a local concern for food security and a community goal to continue to practice subsistence, and thus studies and planning efforts involving these tribes need to address these needs and goals. Future studies need also to engage with the meanings and values attached to subsistence practices by these tribes, as outlined in this report.

Another recommendation is that impact assessments should not assume that these communities think that capitalism is evil—for the interviewees described how they valued both the benefits of capitalism as well as the benefits of subsistence. This study showed that the communities do desire a healthy economy made up of *both* cash and subsistence opportunities—they do not think of *either* capitalism or subsistence when thinking about their futures, as the people express desire for both systems to provide for their well-being. Thus future studies should attend carefully to assessing the tradeoffs between the two systems, at multiple scales (local and state), rather than assume the communities will always be against capitalist opportunities.

This study has thus indicated that important research questions to address potential impacts would involve a variety of social science disciplines, and both quantitative (deductive) and qualitative (inductive) methods: multiple disciplines and interdisciplinary approaches are required to understand the relationship between, for example, economic practice and community/individual identity. Or a comparative study examining the economy of a road-based rural community and one that is not situated on a road.

In summary, agencies and researchers should attend to the following suggestions and assumptions when designing research agendas and questions for impact assessments and planning initiatives:

- Subsistence users are effectively land managers, and have been for thousands of years; therefore, even if they are not the legal land owners of a given area, many villagers have environmental knowledge relevant to assessing both ecological and social impacts of road-building.
- The communities of Allakaket and Alatna desire better subsistence opportunities by the local people—subsistence must be understood as both a cultural and economic practice that provides physical and spiritual well-being, and not as an “undeveloped” and inferior way of life. Thus typical measurements of “economic progress” do not fit with how these residents want to plan for their local economy, and perhaps measurements of well-being, happiness, or food security are superior to measurements of income and employment to understand what makes up a good economy in these villages.
- Politicians and agencies are cautioned against characterizing these communities as “anti-development” just because they express initial resistance to building a road to Ambler; interviewees argue that not all capitalist endeavors are alike, with equal effects upon the local social-ecological system. Some capitalist endeavors might augment the subsistence economy, such as trapping activities, while other land-based activities might pose negative impacts to the subsistence regime. Specificity about the sources of the cash economy and its interactions with

the subsistence economy will allow the tribes to clearly see the tradeoffs presented by the building of a road to Ambler, and will make for better-informed impact assessments.

- Impact studies need to address the potential impacts to food security, and how food security can be achieved (and specific to whether security will be achieved through traditional or non-traditional food sources, or what combination).
- Research activities are advised to use official “participatory” or “community-based” methodologies as a means to learn more about the local environment and economy, to increase community investment in the research results, and to achieve transparency in research and governance.
- Studies in engineering or the natural sciences that aim to address potential ecological impacts of a road should be required to engage the TEK/LTK of the area under study.
- Interdisciplinary studies to understand impacts need to be employed to better integrate TEK/LTK into research designs, and/or use a variety of social sciences to articulate social tradeoffs in impact assessments.
- Researchers and agencies need to employ the local environmental experts, not seek their counsel pro-bono; research monies also need to support tribal administrative capacity to work with researchers. Fiscal benefits for road planning also need to be felt at the local level for the communities to feel valued as a contributor to the research and planning process—and to feel more invested in the results of impact studies. Such are also considered important components of “best practices” of community-based research.
- Regional-level impact studies must be “down-scaled” to better allow local decision-makers and communities to clearly understand the tradeoffs being made by building or not building a road.

Conclusion

This report summarized the TEK and LTK of resident/experts of Alatna and Allakaket, as well as present these experts’ analyses and opinions on potential impacts a road to Ambler might bring to their communities, economies, and ways of life. This report has outlined how these communities think about subsistence and their subsistence activities, and the environmental and social concerns from these community leaders should inform future researchers how to formulate research questions in ways that would be most relevant to these communities. A new road presents the potential for significant change in the economies and identities of people from Allakaket and Alatna. The communities wish to have more sovereignty over their own destinies as citizens of both the State of Alaska and their respective Alaska Native tribal nations. Future planning and research practices need to better involve the tribes and their knowledges and values; it is advised to use formal participatory or community-based research practices to engage these tribal communities in the process of developing impact assessments of both the ecosystem and the social-ecological system. These tribes and individual tribal members may or may not change their minds about a road to Ambler, but any final opinions cannot be decided without addressing the concerns outlined in this report.

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