

Willow Master Development Plan

Appendix J

National Petroleum Reserve in Alaska Integrated Activity Plan Environmental Impact Statement Traditional Knowledge Compilation

January 2023

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**National Petroleum Reserve in Alaska Integrated Activity Plan
Environmental Impact Statement
Traditional Knowledge Compilation**

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Prepared by

Stephen R. Braund & Associates
P.O. Box 101480
Anchorage, Alaska
907-276-8222
907-276-6117 (fax)
info@srbak.com

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List of Acronyms

ADF&G	Alaska Department of Fish and Game
BLM	Bureau of Land Management
BOEM	Bureau of Ocean Energy Management
BSEE	Bureau of Safety and Environmental Enforcement
EIS	Environmental Impact Statement
IAP	Integrated Activity Plan
MMS	Mineral Management Service
NPR-A	National Petroleum Reserve in Alaska
SRB&A	Stephen R. Braund & Associates
USACE	United States Army Corp of Engineers

Note to Readers

To assist readers in identifying new information in this Supplemental EIS, new or substantially revised text is highlighted in light yellow (as shown in this paragraph). Substantial revisions include changes to the text or underlying data that have changed the analysis or analysis conclusion. All sections that are new or include significant or substantial revisions include an asterisk (*) at the end of the section header; all new or substantially revised tables and figures also include an asterisk at the end of the table or figure caption.

1.0 TRADITIONAL KNOWLEDGE COMPILATION

This report provides a compilation of available traditional knowledge that has been documented in the six North Slope communities of Point Lay, Wainwright, Utqiagvik (formerly Barrow), Nuiqsut, Atkasuk, and Anaktuvuk Pass since 1976 and which is relevant to the National Petroleum Reserve in Alaska (NPR-A). Traditional knowledge is defined in a broad sense to include local observations and information that residents have provided regarding their physical, biological, and social environment. In response to a request from the Bureau of Land Management (BLM) that traditional knowledge be considered in the writing of the NPR-A Integrated Activity Plan (IAP) Environmental Impact Statement (EIS), EMPSi subcontracted Stephen R. Braund & Associates (SRB&A) to review existing sources of traditional knowledge and compile the information into a report. This report was later reproduced as an appendix for the Willow Master Development Plan Supplemental EIS and revised, based on agency comments, to incorporate one additional citation. The purpose of this compilation is to provide relevant traditional knowledge organized by various resource topics for consideration and incorporation in the EIS by the EIS resource authors.

SRB&A organized the traditional knowledge quotes using the section headings that are similar to those used in the NPR-A IAP EIS structure. When reviewing the quotes, EIS authors should review the entire document as the quotes often address multiple topics and not just the topic under which SRB&A categorized them (e.g., vegetation and caribou traditional knowledge addressed in the same quote but only categorized under vegetation).

2.0 METHODS

The study team reviewed a variety of sources including the Alaska Department of Fish and Game (ADF&G), Division of Subsistence technical papers; Bureau of Ocean Energy Management (BOEM)/Bureau of Safety and Environmental Enforcement (BSEE), Bureau of Land Management (BLM), Mineral Management Service (MMS) and United States Army Corp of Engineers (USACE) public hearings conducted for EISs; and federal, Native organization, and academically funded studies. The study team's initial review also included a number of studies such as subsistence studies, ethnographies, and EISs which are informed by or incorporate traditional knowledge. For the purposes of this review, the study team only documented sources that contained primary traditional knowledge (e.g., direct quotes included as part of a traditional knowledge or subsistence study, academic publication, or federal public hearings). The study team also only included quotes directly attributed to residents from the six North Slope communities, which are most likely to have direct observations related to the NPR-A.

Each quote identifies the community that provided the observation and the citation for the document. Both the community identifier and publication year attached to the quote provide important context and should be kept in mind when reviewing the quotes for applicability to the NPR-A IAP EIS. For example, some quotes dating from the early 1980s may describe effects associated with seismic survey methods that are no longer being used and may not be applicable to more current seismic survey methods.

The study team focused on compiling quotes that contained traditional knowledge applicable to the nature of development and relevant to impacts and mitigation associated with the IAP, or that contained traditional knowledge about the environment in and around the NPR-A. For example, with caribou, the study team focused on quotes describing knowledge about past impacts to caribou that could parallel potential impacts from future projects described in the IAP or quotes that focused on caribou habitat and movement in the NPR-A. The study team did not include more general traditional knowledge describing overall caribou distribution, migration, behavior, health, or abundance.

For several resource topics, SRB&A identified little to no traditional knowledge relevant to the NPR-A IAP/EIS in the 80 sources reviewed for this compilation. Topics lacking traditional knowledge included Geology and Minerals, Soil Resources, Sand and Gravel Resources, Environmental Justice, Recreation, Wild and Scenic Rivers, Wilderness Characteristics, and Transportation. Other such as Petroleum Resources, Paleontological Resources, and Visual Resources had only a few traditional knowledge quotes identified. The lack of traditional knowledge identified for the above topics does not mean that local residents are not knowledgeable about those topics, but rather that the sources reviewed did not focus on those topics. Furthermore, during the compilation, the

study team categorized traditional knowledge quotes under the resources they were most directly related to; thus, some of the above topics may be addressed indirectly under other resources, in which case SRB&A identified the primary topic where related traditional knowledge could be found in the report. Additional reasons for the lack of traditional knowledge for certain topics that are relevant to the NPR-A IAP EIS include the following:

- A majority of the sources available for review were public scoping testimony, and residents' testimony usually focuses on the issues of greatest concern, and thus do not include traditional knowledge for all physical, biological, and social topics addressed in an EIS.
- Resource topics overlap in their focus, and traditional knowledge that is categorized as one topic may also pertain to another (e.g., socioeconomic/environmental justice, hazardous materials and contaminated sites/human health and safety/air quality).

While SRB&A's review included all major topics addressed in the NPR-A IAP EIS, SRB&A emphasized topics of concern that have been raised by local residents in the past including air quality, water resources, caribou, fish and fish habitat, noise, subsistence, sociocultural systems, economy, and public health. SRB&A also emphasized traditional knowledge that addressed key topics/questions provided to SRB&A by the EIS resource section authors. Where applicable, SRB&A added these topics as subheadings (e.g., Caribou under Terrestrial Mammals, Water Quality under Water Resources). SRB&A also added additional subheadings under several of the resource topics when there were many quotes that could be categorized under several themes. SRB&A's review also did not include a review of residents' issues and concerns regarding development in general or any mitigation measures proposed by residents in past projects.

3.0 RESULTS

3.1 Introduction

SRB&A reviewed 81 sources of traditional knowledge from publications dating between 1976 and 2019 (Table 3-1). The table lists each of the sources reviewed and provides relevant traditional knowledge topics addressed in each source under Physical, Biological, and Social environment headings. The table also includes a heading of Other that primarily identifies if the source included scoping comments and issues and concerns. The following sections provide traditional knowledge quotes by the NPR-A IAP EIS sections.

Table 3-1: Traditional Knowledge Topics by Source*

Citation	Physical Environment	Biological Environment	Social Environment	Other
(ABR Inc., Sigma Plus Statistical Consulting Services, SRB&A (Braund Stephen R. & Associates), and Kuukpiik Subsistence Oversight Panel Inc. 2007)	Climate and Meteorology, Water Resources, Solid and Hazardous Waste	Fish	Subsistence Uses and Resources	—
(BLM 1982)	Water Resources	—	Subsistence Uses and Resources	Scoping Meeting / Issues and Concerns
(BLM 1997a)	Acoustic Environment	—	Terrestrial Mammals	Scoping Meeting / Issues and Concerns
(BLM 1997b)	Paleontological Resources, Solid and Hazardous Waste	—	Cultural Resources, Subsistence Uses and Resources, Public Health	Scoping Meeting / Issues and Concerns
(BLM 1998a)	—	Terrestrial Mammals	Subsistence Uses and Resources	Scoping Meeting / Issues and Concerns
(BLM 1998b)	—	Terrestrial Mammals	—	Scoping Meeting / Issues and Concerns
(BLM 1998c)	—	Birds, Terrestrial Mammals, Marine Mammals	Landownership and Uses, Subsistence Uses and Resources	Scoping Meeting / Issues and Concerns
(BLM 1998d)	—	Subsistence Uses and Resources	Public Health	Scoping Meeting / Issues and Concerns
(BLM 2002)	—	Terrestrial Mammals	Landownership and Uses, Subsistence Uses and Resources, Sociocultural Systems	Scoping Meeting / Issues and Concerns
(BLM 2003a)	Acoustic Environment	Fish, Birds, Terrestrial Mammals	Subsistence Uses and Resources	Scoping Meeting / Issues and Concerns
(BLM 2003b)	Water Resources	Wetlands and Floodplains, Terrestrial Mammals, Marine Mammals	Subsistence Uses and Resources, Sociocultural Systems, Public Health	Scoping Meeting / Issues and Concerns
(BLM 2003c)	—	Terrestrial Mammals	Subsistence Uses and Resources	Scoping Meeting / Issues and Concerns
(BLM 2003d)	Water Resources	Terrestrial Mammals	Subsistence Uses and Resources	

Citation	Physical Environment	Biological Environment	Social Environment	Other
(BLM 2004a)	Vegetation	—	Subsistence Uses and Resources	Scoping Meeting / Issues and Concerns
(BLM 2004b)	Renewable Energy	Fish	—	Scoping Meeting / Issues and Concerns
(BLM 2004c)	Water Resources	Birds, Terrestrial Mammals	Subsistence Uses and Resources	Scoping Meeting / Issues and Concerns
(BLM 2004d)	Vegetation	Terrestrial Mammals	Subsistence Uses and Resources, Economy	Scoping Meeting / Issues and Concerns
(BLM 2004e)	—	—	Economy	Scoping Meeting / Issues and Concerns
(BLM 2004f)	Climate and Meteorology	Vegetation, Fish, Terrestrial Mammals	Landownership and Uses, Subsistence Uses and Resources, Sociocultural Systems	Scoping Meeting / Issues and Concerns
(BLM 2007)	—	Wildland Fire, Terrestrial Mammals	—	Scoping Meeting / Issues and Concerns
(BLM 2014a)	—	—	Subsistence Uses and Resources	Scoping Meeting / Issues and Concerns
(BLM 2014b)	—	—	Subsistence Uses and Resources, Economy, Public Health	Scoping Meeting / Issues and Concerns
(BLM 2014c)	—	—	Subsistence Uses and Resources, Sociocultural Systems	Scoping Meeting / Issues and Concerns
(BLM 2016a)	—	—	Public Health	Scoping Meeting / Issues and Concerns
(BLM 2016b)	—	Vegetation	—	Scoping Meeting / Issues and Concerns
(BLM 2018a)	—	Terrestrial Mammals	Subsistence Uses and Resources, Economy	Scoping Meeting / Issues and Concerns
(BLM 2018b)	—	Cultural Resources	—	Scoping Meeting / Issues and Concerns
(BLM 2018c)	Physiography	—	Economy, Public Health	Scoping Meeting / Issues and Concerns
(BLM 2019a)	Renewable Energy, Petroleum Resources	Birds, Terrestrial Mammals	—	Scoping Meeting / Issues and Concerns

Citation	Physical Environment	Biological Environment	Social Environment	Other
(BLM 2019b)	Physiography	Birds, Terrestrial Mammals	Subsistence Uses and Resources	Scoping Meeting / Issues and Concerns
(BLM 2019c)	—	—	Public Health	Scoping Meeting / Issues and Concerns
(BLM 2019d)	—	—	Cultural Resources, Subsistence Uses and Resources	Scoping Meeting / Issues and Concerns
(BLM 2019e)	—	Terrestrial Mammals	—	Scoping Meeting / Issues and Concerns
(BOEM 2011)	Climate and Meteorology	Fish	Sociocultural Systems	Scoping Meeting / Issues and Concerns
(BOEM and BSEE 2013)	—	Marine Mammals	Subsistence Uses and Resources	Scoping Meeting / Issues and Concerns
(Braem, Mikow, Brenner, Godduhn, Retherford, and Kostick 2017)	Acoustic Environment	Birds	Subsistence Uses and Resources, Sociocultural Systems	—
(Braund, Lawrence, Sears, Schraer, Regehr, Adams, Hepa, George, and Von Duyke 2018)	—	Marine Mammals	—	—
(Brewster and George n.d.)	Water Resources	Fish	Subsistence Uses and Resources	—
(Brown, Braem, Mikow, Trainor, Slayton, Runfol, Ikuta, Kostick, McDevitt, Park, and Simon 2016)	—	Fish	Subsistence Uses and Resources, Sociocultural Systems Public, Health	—
(Brown 1979)	—	—	Subsistence Uses and Resources	—
(Carothers, Cotton, and Moerlein 2013)	—	Fish	—	—
(Inc., Consulting, Research, Callaway, Associates, and Economics 2008)	Acoustic Environment. Water Resources	Marine Mammals	Subsistence Uses and Resources	—
(FEA 1976)	Acoustic Environment, Water Resources	Fish, Terrestrial Mammals	Subsistence Uses and Resources,	Scoping Meeting / Issues and Concerns
(HDR Alaska 2015)	—	Fish, Terrestrial Mammals	—	—
(Mager 2012)	—	—	Subsistence Uses and Resources	—

Citation	Physical Environment	Biological Environment	Social Environment	Other
(MBC AES 2004)	Climate and Meteorology, Physiography, Water Resources	Wetlands and Floodplains, Fish	Subsistence Uses and Resources, Economy, Public Health	—
(McBeath and Shepro 2007)	—	Fish	—	—
(Mikow, Retherford, Kostick, and Godduhn 2016)	Climate and Meteorology, Physiography, Solid and Hazardous Waste	—	Subsistence Uses and Resources	—
(MMS 1979a)	Water Resources	Cultural Resources	—	—
(MMS 1979b)	Water Resources	Terrestrial Mammals, Marine Mammals	Cultural Resources, Public Health	Scoping Meeting / Issues and Concerns
(MMS 1982)	—	Fish, Birds	—	Scoping Meeting / Issues and Concerns
(MMS 1990)	—	—	Economy	Scoping Meeting / Issues and Concerns
(MMS 1997)	Acoustic Environment	—	—	Scoping Meeting / Issues and Concerns
(MMS 2001a)	—	Terrestrial Mammals	—	Scoping Meeting / Issues and Concerns
(MMS 2001b)	—	Fish	—	Scoping Meeting / Issues and Concerns
(MMS 2006)	—	—	Public Health	Scoping Meeting / Issues and Concerns
(MMS 2007a)	—	Birds, Terrestrial Mammals, Marine Mammals,	Subsistence Uses and Resources	—
(MMS 2007b)	Acoustic Environment	Marine Mammals	—	Scoping Meeting / Issues and Concerns
(MMS 2007c)	—	Fish	—	Scoping Meeting / Issues and Concerns
(MMS 2009a)	—	Fish, Terrestrial Mammals	Public Health	Scoping Meeting / Issues and Concerns
(MMS 2009b)	—	Marine Mammals	Sociocultural Systems, Public Health	Scoping Meeting / Issues and Concerns
(Spearman and Nageak 2005)	—	Fish	—	—

Citation	Physical Environment	Biological Environment	Social Environment	Other
(SRB&A 2003)	Acoustic Environment, Solid and Hazardous Waste	Fish, Birds	Subsistence Uses and Resources	—
(SRB&A 2009)	Air Quality, Acoustic Environment, Physiography, Water Resources, Solid and Hazardous Waste	Vegetation, Wetlands and Floodplains, Fish, Terrestrial Mammals	Landownership and Uses, Cultural Resources, Subsistence Uses and Resources, Sociocultural Systems, Economy, Public Health	—
(SRB&A 2010a)	Acoustic Environment	Fish, Birds, Terrestrial Mammals	Subsistence Uses and Resources	—
(SRB&A 2010b)	—	Terrestrial Mammals	Subsistence Uses and Resources, Sociocultural Systems, Economy, Public Health	—
(SRB&A 2011a)	Climate and Meteorology, Water Resources	Fish, Birds, Marine Mammals	Subsistence Uses and Resources	—
(SRB&A 2011b)	Acoustic Environment	Terrestrial Mammals	Subsistence Uses and Resources, Visual Resources	—
(SRB&A 2013a)	Climate and Meteorology, Acoustic Environment, Solid and Hazardous Waste	Fish, Terrestrial Mammals, Marine Mammals	—	—
(SRB&A 2013b)	—	Terrestrial Mammals	—	—
(SRB&A 2013c)	—	Wildland Fire, Fish, Terrestrial Mammals	Subsistence Uses and Resources	—
(SRB&A 2014a)	Solid and Hazardous Waste	Terrestrial Mammals	Subsistence Uses and Resources, Visual Resources	—
(SRB&A 2014b)	Climate and Meteorology	Fish, Birds, Terrestrial Mammals, Marine Mammals	Cultural Resources, Subsistence Uses and Resources, Sociocultural Systems	—

Citation	Physical Environment	Biological Environment	Social Environment	Other
(SRB&A 2015)	Petroleum Resources	Terrestrial Mammals	Subsistence Uses and Resources, Sociocultural Systems, Visual Resources, Public Health	—
(SRB&A 2016)	—	—	Subsistence Uses and Resources	—
(SRB&A Unpublished)	Climate and Meteorology, Physiography, Water Resources	Vegetation, Wildland Fire, Fish, Birds, Terrestrial Mammals	Cultural Resources, Subsistence Uses and Resources, Sociocultural Systems, Economy	—
(SRB&A 2012)	Climate and Meteorology, Air Quality, Acoustic Environment, Physiography, Paleontological Resources, Water Resources	Vegetation, Wetlands and Floodplains, Wildland Fire, Birds, Terrestrial Mammals	Cultural Resources, Subsistence Uses and Resources, Sociocultural Systems, Public Health	—
(USACE 1983)	Acoustic Environment	—	—	—
(USACE 2010)	Acoustic Environment	—	—	Scoping Meeting / Issues and Concerns
(Wolfe 2013)	—	Marine Mammals	—	Scoping Meeting / Issues and Concerns
(Worl and Smythe 1986)	—	—	Cultural Resources, Sociocultural Systems	—

3.2 Physical Environment

3.2.1 Climate and Meteorology*

At my home I have a barometer and have learned how to read it. This year and the past few years, I have noticed changes that occur. The barometer would indicate that a wind from the west would be coming and then out of the blue an east wind would come and vice versa. So it seems like our weather cycle has done a circle. So what is occurring with the weather is actually opposite of what the barometer is indicating that it should do. (Nuiqsut) (MBC AES 2004)

It's unpredictable nowadays. Sometimes we wait and wait for the wind to die down before we go out boating. The last time they brought the whale in those boaters were really wet. Well [the ice] is not as thick as it used to be. We hope that the ice doesn't break off when the wind [comes in] from the northeast. (Wainwright) (SRB&A 2013a)

Easterly direction wind, we're going to be shallow.... East wind we get shallow waters. Westerly winds, southwest winds will push it in. (Point Lay) (SRB&A 2011a)

It's taking longer to become stationary ice. We can have an open ocean in January because the wind has broken it up. We can have big piles of ice on the barrier island. (Point Lay) (SRB&A 2011a)

And just being a hunter, I've noticed the ice is not as thick as it used to be. We're losing two weeks out of the year in the spring, thawing out too early. And then in the fall time, we're gaining over two weeks before it freezes up again. (Utqiagvik) (BLM 2004f)

The past five years have been very unusual. There has been an early spring thaw out. We would be boating when it wasn't the time for us to be boating. This weather has been a phenomenon. (Nuiqsut) (MBC AES 2004)

I am now 82 years old and can remember since the time I was 9, when there used to be slow transitions from cold conditions to warm conditions. Now, these transitions from cold to warm are fast and abrupt. Fall used to freeze fast and now it is the reverse, the fall freeze is slow. (Nuiqsut) (MBC AES 2004)

A long time ago the Elders, when she was able to remember her surroundings, our Elders have spoken that the earth was going to shift. It is shifting today. Climate change in the Arctic, blizzards, snowstorms in the Lower 48, those are the kind of changes that the Elders have spoke of. And I, for one, I am witnessing this today. One day we will not have any winter. There will be no winter on this Arctic. The North Slope is going to be like Lower 48, ice and snow free. We will be able to travel year-round by boat. There will be vessels out there, either for industrial or commercial, which will be open. And it's already opening. (Nuiqsut) (BOEM 2011)

Of course, the ice has changed. [Hunting partner] and I used to go out and find pack ice, and it was different weather. It would have its own weather. Gray and wet and windy. It was less long and 30 feet high. We haven't seen that for 20 years. We've seen ice that's eight to 12 feet thick on top, which means it's 30 to 40 feet below. That's out deeper or it gets grounded. There's still that kind of ice going by and it's doing some gouging. It gets stuck. We're looking for ice that gets stuck because that's where the ugruks are. Near any inlet you can get in behind it but not too far. (Point Lay) (SRB&A 2011a)

The only thing that I'm worried about is the ice conditions, the thickness of the ice, we're getting less. Ever since about three years ago I started noticing it. Taking a little longer to freeze out there. A lot longer this year. Usually we won't see any open water out there for a mile. This time of year, we seen a lot of open water. Usually the whole area is just solid ice where we can just travel by snowmachine and not worry about falling through. (Point Lay) (SRB&A 2014b)

The ice is, like, an inch lesser than it used to be. When you fish lots, you notice the difference. That's been in the past three, four years. The water levels in the rivers are lower than what they used to be when it

freezes. About six inches lower than it used to be. The lagoon ice used to freeze over six feet. It used to take us hours with an ice pick to get a hole. And now it only takes about a half an hour, 45 minutes. We check the ice ever year, and we've been busting through to water at four feet, and it used to be six feet. That's in January when the sun comes back; we go do the check for the ice, the thickness. (Point Lay) (SRB&A 2011a)

About five years ago [the ice started changing]. You can tell it's just getting less. I hope there's more ice this year, or next year. We'll see, we'll measure the ice. The ice we got that whale on, the whale wasn't supposed to go on the ice [because it was so thin], but we actually got it up. (Point Lay) (SRB&A 2011a)

[The weather is] changing [and becoming] warm. [It is] warmer up north, [in] Barrow. In Nuiqsut [the weather] don't change that much. But Barrow, it's warmer than this place! People they talk about it. They say the weather is getting warmer. Now it's down to 20 below. Or 35 [below] or so. I don't know what makes the temperature change in winter. Those people down Barrow they talk about "it's getting warmer and warmer every year" down there. I don't know from what. It used to be c-o-o-o-o-ld! Changing something, I don't know. (Anaktuvuk Pass) (SRB&A Unpublished)

There's been a different winter, in which there was a sound that was like a big bang and all of a sudden there was a storm that sets in. You couldn't even see across the street to the outhouse. (Anaktuvuk Pass) (SRB&A Unpublished)

This year we got a lot of snow, more than usual. You can tell, there's a lot of little snow in areas and now it's way up drifting. Where you're camping in those places, you used to camp right next to the hillside, now it's drifting every year. I think snow is getting more and more. Snow this year, there is a lot all over. This year we had a bad one. [It has been] snowing every day. I came down every morning and say "it's snowing again?!" We got a lot of snow all over. (Anaktuvuk Pass) (SRB&A Unpublished)

Melting, the climate. Global warming. Those ponds are not just forming but drying out. Permafrost shifting and melting more heat I suppose. Not evaporating and draining. In the last few years. I know it happens but it seems to be happening in the last few years. If you go to a lake that you know to be deep or a hole or anything, when you come to the edge of it has gone down on the edges. I would say throughout up here to Barrow and Deadhorse. (Nuiqsut) (SRB&A 2012)

It, the weather that has caused the water temperature to rise. Because of the tundra up here is hot. It affects the water and the river flows into the Beaufort Sea and today it is a lot warmer than it has been in the past. It is changing with the climate change that we are experiencing. (Nuiqsut) (SRB&A 2012)

When I was growing up the weather was a lot warmer in both summer and winter. During the years past it has changed to where... in March when I was growing up the weather would start warming up. In like November, December, January, February, that would be the coldest part of the year. Today they still are but March is to. It is unusual to see something like this, where it is over 50 below to where it is cracking the tundra in March. When it cracks it makes a lot of noise, it never used to do that when I was young today it is changing. Our weather is so different compared to what I observed in the 40s and 50s. Today we don't have any [prevailing] wind directions. (Nuiqsut) (SRB&A 2012)

The changes are due to possibly climate change. It was bound to happen because our elders have been speaking about it. They would think that there would never be blizzards or cold fronts. I am surprised there is a cold front now. It is very unusual to have weather like this without wind. We don't have, we don't know if there is going to be a blizzard or not. It used to be a lot warmer and windier when we were kids, today it is different. As for the ocean current I cannot speak to that, because that is for men to speak of. I can speak on the land issues because that is what I have experienced. (Nuiqsut) (SRB&A 2012)

In the fall time we get real strong winds, and then again in the winter. Last year we had 75 mile an hour winds in town which was pretty crazy. It doesn't happen all the time. Not really anything new. It is what you expect when you live up here. Sometimes it gets a little bit warmer when it gets windy, and when there is no wind at all it can be like 80 below with no wind. When it got windy it warmed up. It pushes all the

wind from down south, it depends on the direction. It will get windy on the coast, if it is nice here it can be windy out there. You go to get away from the mosquitos. (Nuiqsut) (SRB&A 2012)

Back then we used to have more thunder clouds more thunder more rain more massive flooding and a combination of hail storms that we would see when we were young. Today we don't see that, those thunder storms we would see in the past and hardly any of those hail storms. It seems like they used to have more in the area. The weather pattern is changing every season. Hail storms usually started in August and September and those times used to be a rainy season and now it seems like it is a lot warmer. During my time it was hot with a lot of thunder storm... Now we hardly see those types of storms anymore. We used to have massive blizzards but today we hardly have any blizzards. (Nuiqsut) (SRB&A 2012)

Back then we would have massive amounts of snow; lots of blizzards and a lot of snow. Some of the areas on the river bank and the slopes would be covered in snow and those cliffs up there [Colville Bluffs?] are strait down and those cliffs would be gradual slopes with all of the snow. Today you don't see many blizzards and less snow overall. There are changes within my lifetime. We see less snow less blizzards and less snowfall today. That is why we have less water during the breakup time. (Nuiqsut) (SRB&A 2012)

We get less [snow] storms now. What I'm thinking is global warming, because down states they're getting all the snow. Before I left Anchorage, it got 16 inches. Here, we finally got some snow. Couple years, four years ago, we got every street filled to the housetops. You couldn't even see the truck going by. [There were] walls of snow. The school bus, you could only see the school bus that much [over the top of the snow]. It's more like getting colder and colder and some days it will get warm, and when you look at the lagoon you would see some [open] spots. (Point Lay) (SRB&A 2014b)

Currents will change. Weather's such a factor nowadays. We know that it's staying warm longer; the ice is taking longer to freeze, or the water is taking longer to freeze, and the ice is not as thick anymore as it normally would be in any winter. Like back about 40-50 years ago it would be 15-20 feet thick of ice. Now it's barely 4 feet, maybe not even 2 feet in some places. There's a lot of change in the ice. (Point Lay) (Mikow et al. 2016)

It usually freezes in September. When I was growing up, I'd be going to school and checking out the lakes and go skating, ice-skating, during school Early September. Now it's freezing later...in October, starting to. (Wainwright) (Mikow et al. 2016)

3.2.2 Air Quality

See traditional knowledge provided in the PUBLIC HEALTH section for traditional knowledge that is also applicable to this section.

Yes, we always see it every year. A haze, a dirty haze in the winter, all the haze goes down to ground level. (Nuiqsut active harvester; Experience timeline: 1980 and ongoing; Experience location: Kuparuk on over to Nuiqsut. SRB&A Interview 2007). (SRB&A 2009)

This fall I went out boating. I drove into a haze just off the Point (Barrow). It gave me a headache. It only stayed a few days until the wind blew it out. A big old, yellow cloud. I thought it came from the east, the oil field area. (Barrow active harvester; Experience timeline: 2006; Experience location: Pt. Barrow. SRB&A Interview 2007). (SRB&A 2009)

Our air quality is a concern. The industry is moving closer to us. They are burning waste oil and natural gas. This is in combination with what is coming up from down south with the warm air and then dropping down in the cold air. (Barrow active harvester; Experience timeline: 2001 and ongoing; Experience location: Barrow, Nuiqsut. SRB&A Interview 2007) (SRB&A 2009)

Air quality compared to how it was a long time ago has gotten a lot worse. I never notice the yellow haze around Nuiqsut when I was a kid. I started noticing it when Alpine came. I know when we are getting close to Prudhoe and that's how I know when I am getting close. When we drive there. We would go to

get gas and see the yellow haze, now it is all around here now too. One of my aunts, she was a community healthy aid. She has noticed a lot of asthma in the last few years and that it's on the rise. You can see it on YouTube, she talks about all of that. (Nuiqsut) (SRB&A 2012)

The air pollution too. You can see it on a real nice day. There is a yellow haze if you look out you can see it. You probably could see it now. It's that way. Even in summer time you can see it too when it is a nice sunny day and you can see that yellow stuff. (Nuiqsut) (SRB&A 2012)

The winds too, they go back and forth a lot of the time. I have seen the wind change direction really quickly it seems like it all blows back to the same spot. If you can see the smog out there you know that it is somewhere in town. If you drive on the dump road past the natural gas station and you have your heater on in your truck it will suck it into your truck and give you a headache. You will smell the natural gas every time. All the toxins and carbon monoxide, when you release the pressure you see a big flame up in the air. All that exhaust we are breathing that I know. (Nuiqsut) (SRB&A Unpublished-b)

Sometimes it will look darker and sometimes it will look lighter. Occasionally I will look out and it will be brown instead of yellow. I think that the winter is worse because there is no moisture in the air so all of the toxins just hang out there. You can tell if you stay here the whole winter and then summer comes around and it's different. (Nuiqsut) (SRB&A Unpublished-b)

At Alpine. It's about this time of the year that you start seeing that yellow haze and black smoke from the industry. All the way to Prudhoe Bay. You can see that yellow haze, it looks almost like lights. On the east side to by Oliktok and towards Kuparuk. And there might be some offshore at Northstar and Endicott. Those were also traced some particles going out. (Nuiqsut) (SRB&A Unpublished-b)

When they do flare ups all of the chemicals that they are dividing from the oil, and what has to be re-burned. Not all of it is burned. It is blown away before it even starts burning. Some of those fluid, chemicals are blown by the wind so it is carried elsewhere. They call that a flare up every time there is a lot of pressure or when they are separating oil or a lot of chemicals. It has to be cleaned, and divided with sand/silt/water. Other chemicals that are combustible are flared up. Some of it is not burned it is blown elsewhere. And also the acid rain that brings down those chemicals. (Nuiqsut) (SRB&A Unpublished-b)

It seems like there is a lot of smog lately. It seems like there is a lot of pollution. (Nuiqsut) (SRB&A Unpublished-b)

3.2.3 Acoustic Environment

3.2.3.1 Noise Effects on Subsistence Activities and Resources

See traditional knowledge provided in the SUBSISTENCE - NOISE, TRAFFIC, AND HUMAN ACTIVITY section for traditional knowledge that is also applicable to this section.

Onshore/Terrestrial Areas

The fact that we are not used to it (noise) affects us. I know more of the traditional hunters would much rather have it how it was, the quietness. You could hear the animals coming in, maybe the sounds geese and ducks make. And not just the sound but the smell. Walrus' for one you can smell. You can also smell the algae that comes up from the sea bottom and gets green. When that happens you know there is some kind of marine life out there. Waterfowl or maybe seagulls. (Nuiqsut) (SRB&A 2012)

The concern I have is with [my aunt]'s fish camp there. It's right by Alpine. And it upsets us because they run those airboats, on land and water and the noise scares off our game. They run wherever they want to with those choppers too. My aunt calls 'em noise makers. We can't pick eggs no more because they disrupt the birds and other game too. (Nuiqsut active harvester; Experience timeline: 2000 and ongoing; Experience location: Nigelik Channel. SRB&A Interview 2007). (SRB&A 2009)

When we were growing up we were always told to keep quiet. They can hear very well. We were taught this from our ancestors. We were told not to yell or holler. They can hear very well. (Wainwright active harvester; Experience timeline: 1951 to present; Experience location: Wainwright. SRB&A Interview 2007). (SRB&A 2009)

Just to recall back in my time when we was in that area fishing with a hammer - you could use a hammer to strike right on the ice -observing the fish below you - you can strike right on the ice itself, stun the fish and kill it and kill it. That's how sensitive a noisemaker would be in any of these areas. I would say that permafrost would have the same effect, the detonation of a strong impact could be used in the permafrost. (Utqiagvik) (FEA 1976)

First time [I experienced an impact] last year was when I saw a couple of airboats up there [Nigliq Channel]. You can hear them things for miles and miles. I've heard people complain about them when they go up river. That was in late May right before it broke up, that is when they start with the airboats and then they are there throughout the summer, on the main channel. There's just so much activity going on with the oil company, they are just trying to check up on everything, make sure there's no spills or nothing. (SRB&A Nuiqsut Interview May 2010). (SRB&A 2010a)

Airboats, they got airboats that are too loud [whole delta area.] That is every summer, July, August, end of June. You can hear the airboat before you ever see it. One time we had an accident a couple of summers ago, and we needed an assist from Conoco Phillips, a guy [fell] in the river, and we heard this thing coming, and it was so loud that we could hear it before we could ever see it. They do exercises, like a lot of oil-spill exercises. It's too shallow for [other kinds of boats] like they could use a jet unit, but they use an airboat for when it's too shallow. They have no access other than the use of the airboat. And then sometimes down by CD4 you will have an airboat and a small medium cargo boat, there is a little slough in there by CD4 and that's the one that they want to dredge in there and try to get into the lake, and then they could use that as a staging area as a possible use for area for oil spill response, but the community said no and then they rejected the application for the permit for that. (SRB&A Nuiqsut Interview May 2010). (SRB&A 2010a)

What they mentioned about the noise, and I guess that's why the fish are not coming back or they're depleting. That's one of the things you should study or monitor as you said. This drilling, you can barely hear it up, you know, up on the ground, but down it goes deeper and, you know, noise travels further especially I guess if it's close to the water. And I'm just saying that that could be the cause. And, as you may or may not know, we all love ahnalik here and we need it, too. So we need that for our subsistence. (Utqiagvik) (BLM 2003a)

The air boats, every time they go do their surveys, or checking their Conexes, they disrupt anything that is there and us too. And the caribous will take off, or the seals will pop down; anything that is near that [noise], they take off. (SRB&A Nuiqsut Interview April 2010). (SRB&A 2010a)

They have those airboats that do that training. We do have a lot of airboats down there. They have access to a boat ramp at CD 4, and then you have those zodiac boats that come around from CD3 and they come around and go in this channel. I've seen how many that come around and go in. It has to be in this area. They come out from these two [channels]. And you know that the community is not informed about when they are going to have an exercise about those airboats. If we would know, that would inform our hunting. And now they have a bigger one [airboat] that is bigger than the two-seater. They are louder than the planes [airboats]. You could hear them before you could see them. That is a concern to the area. That would be during the duration of the summer. Sometimes it could go later, like mid August. (Nuiqsut) (SRB&A 2010a)

I've got my camp down there [on Nigliq Channel]. There is always traffic through the river all through the summer, the loud boats all summer. And across is my brother's [cabin]. They drive around until September (June through September). They always come from somewhere from the ocean and then the go through the river all the way to Nanuq, and then they always go back out. (Nuiqsut) (SRB&A 2011b)

Plenty [of traffic]. Especially those boats with loud noise. Go through my allotment every summer. Really loud, you can hear them from a distance. Airplane, helicopter fly everyday. Even small planes, sometimes, Summer, in summer, mostly always fly. They always go through towards Fish Creek, land by my allotment, helicopters down there. Every summer, in July, June. I never see much in August, I always go up river moose hunting. They got three of them [airboats]. They can go through the shallow water. Lots of noise. Some of them get spooky. That noise is no good for an animal. Yeah, when some of the caribou get spooked, they run off. When they get spooked they just start running away. (SRB&A Nuiqsut Interview March 2009) (SRB&A 2010a)

I think I've heard that concern now from two other persons that directly told me that the existing seismic is already impacting subsistence hunters as we speak, that the seismic area has no game. The impacts, like Harry said, has scared and run the game off in one direction from that area already and numerous trips made by at least half a dozen hunters have attested that, that they've gone from the east side of the Ikpiukuk and Chipp River to the west side, where they're not there in that seismic area anymore. So these people have purchased gasoline and planned their trips just to find out that the seismic is in that area already and went up to those areas of normal hunting and the game is not there. So I just wanted to support Harry's comments in that sense. (Utqiagvik) (BLM 1997a)

Humming coming from the infrastructure and facilities. If you are in proximity you hear it. 2-3 miles. And there are some occasions that they are flaring up their gas how they flare up and you can see a big flame and hear it too if the wind is right and it is coming this way. (Nuiqsut) (SRB&A 2012)

Some of the animals behave abnormally. Anytime they hear a noise they gather in a bunch. They don't know which way to go. I guess when they build the ice roads, all the noise and lights causes them to behave differently. When you get them by surprise, they know what way to go, but if you get in front of them, they bunch up and wait on you. (Barrow active harvester; Experience location: around Barrow area and further inland. SRB&A Interview 2007). (SRB&A 2009)

You know I just wanted to mention what some of my personal observations with what's happening with that seismic out there and that seismic displacing the animals, I just wanted to pass this on for your information and I didn't see any furbearers except for the foxes, the red foxes and the different faces anyway. I didn't see no wolves out there, no tracks or anything like that. I was on my way back home just this Saturday and met up with my cousin and he just said, yeah I just ran into a set of wolverine tracks and followed them 26 miles one direction, and he didn't take a close look at the tracks and he started following the trail and it had just been scared away from where the activity was occurring, which was up on the tops against that southeast side of Teshekpuk up in this Pikes dunes out there and he found the den and the rig had just gone by. I just happened to be there when he was following the trail and coming back, he said he just followed the trail 26 miles one direction and the wolverine had just made a bee line from where the seismic activity was going on, it had been scared away from its den, it was just moving out. And there was no caribou in the area, well you know I'd seen that, I made these trips up to my cabin, it's up and the Ikpiukuk River and I've observed the displacement of the wildlife over the winter. I've been going back and forth since December to just last week and I've seen the different areas where they've been over the winter, and I just wanted to bring that out, of my personal observations where, and I just wanted to back up what Noah and what Warren was saying about, you know, I'm not going to be opposing any development or the different phases of the development. I just want to put that on record. (Utqiagvik) (BLM 1997a)

They tend to drive the game away. The caribou in particular, not so much the fish. They migrate all the time. The caribou are moved off by the noise. In September when they're all fat, the same with the spawning fish. In the early 1980s, rollagons, seismic crews, and ice roads started. I hunt wolverines and wolves in winter, occasionally. But there are so few wolverines now, maybe because of the noise.... I do a lot of geese hunting; they're not as affected by the seismic crews, even when they're nesting. I do that in spring, right after whaling. Now they came up with that bird flu, I hope I don't get that! (Barrow active harvester; Experience timeline: 1982 and ongoing; Experience location: by Teshekpuk, south end in the river. SRB&A Interview 2007). (SRB&A 2009)

I do a lot of fishing. It will certainly change the migration of fish through gravel extraction or adding on. I have seen when the barges dock out here, and all the noise pollution from the engines. We all know that water is a good conductor for noise. As sensitive as they are, any noise will affect the migration route. The gray whales and belugas go to a certain point, and then go around it. This affects the fish species as well. During the storms and the barge dock, I have a net out by the point in Elson Lagoon. I get less fish. When the barges leave, I get more fish. (Barrow active harvester; Experience timeline: 2002 and ongoing; Experience location: Elson Lagoon. SRB&A Interview 2007). (SRB&A 2009)

Nearshore/Marine Areas

When a captain came in to talk to me, I knew he was going to say that the whales are displaced [by noise] farther than you scientists think they are. But some of them would also talk about 'spookiness'; when the whales were displaced out there and when the whaler would get near them, they were harder to approach and harder to catch (USDOI, MMS, 1997, USDOI, MMS, Herndon, 2001 [2002-2007 5-Year]). (Utqiagvik) (MMS 2007a)

A lot of whales are traveling farther out than before. Five years ago they would go right off the point; now it is 20-30 miles. Too noisy, there has been a big change since seismic activity. (Utqiagvik) (Inc. et al. 2008)

Twenty-two years ago, the Federal Government refused to listen to our people on issues related to the size and health of the bowhead whale population. Yet today, after the millions of dollars the North Slope Borough has had to spend on this, they must acknowledge that our Whaling Captains were right all along. Again, seven years ago, we were ignored [when we told the National Marine Fisheries Service and ARCO Alaska that seismic noise caused the bowhead whale migration to deflect off shore] and again millions of dollars were spent to find that, again, our Whaling Captains were right. Despite this history, when we speak today on issues related to bowhead whale behavior, we continue to be scoffed at or ignored. I ask you, how successful would a bowhead whale subsistence hunter be if he did not have an intimate knowledge of the whale's behavior? (Utqiagvik) (Inc. et al. 2008)

Of all the animals that I've known, the wolves are, when you are hunting them, they're very noise sensitive, but more so are the bowhead whales. Any noise that they hear, they respond to that by going, moving away from it. A lot of times polar bears are different. Their curiosity can kill them very easy. They go toward the noise or anything that moves, they go for that. (Nuiqsut) (SRB&A 2003)

Noise redirects marine mammals away from shore and toward the ice pack. It makes it more dangerous for hunters. (Wainwright active harvester; Experience location: offshore Wainwright. SRB&A Interview 2007). (SRB&A 2009)

Industrial noise, vibration, aircraft, including choppers. They're way louder than airplanes. I guess the animals always hear the noise and they go further out. We used to go out and there'd be a lot of seals out there. Now we have to further out to get them. Ugruk too. We used to go to Imaliktuk Island (Eider Island) when the weather gets real bad, but that place is real close to that oil island, and now they don't want us going there without escort; or we might have a barrier we can't go past, like a line. It's just really noisy now. Before Alpine was built it used to be nice and calm and you could just hear ice. Now, during the summer, when they're real active you could hear them 20 miles away and the noise travels better on the ocean than on the land. You can really hear it. (Nuiqsut active harvester; Experience timeline: since 2000 and ongoing; Experience location: Alpine/Eider Island. SRB&A Interview 2007). (SRB&A 2009)

One of the real concerns that we've got with this type of development is noise. Noise is something that maybe two or three years ago was much quieter all respects than now, but people are becoming much, much more concerned about the influence of noise on particularly the migratory route of the bowhead, and a lot of this happen to be related to a very clear situation that seems to be developing here in Barrow, and that is that since 1977, I think it is, there's only been one bowhead caught here in Barrow in the fall time, and from talking to a fair number of whaling captains here in Barrow, the feeling is that the animals

in the fall are just steadily moving further and further out to sea off of Point Barrow. Thomas Albert. (Utqiagvik) (USACE 1983)

And that the whales are sensitive to seismic sounds, to drilling sounds, to ship sounds, et cetera, et cetera. So the concern, of course, is, especially with barging, is why I asked about the timing of the barges, that the potential for the tugs that are pushing or pulling the barges, as well as the barges themselves, very feasibly will deflect bowheads. And so there's a concern about the subsistence hunts in Kaktovik, Nuiqsut and Barrow, and making sure that those hunts aren't disrupted, but also making sure that impacts to the whales themselves and to the kinds of the survival reproduction of the whales is not impacted. Robert Suyden. (Utqiagvik) (USACE 2010)

The noise impacts have a devastating effect on fall whaling as demonstrated during the 1989 fall hunt in Barrow. All the meat was lost because our hunters had to go to great distances to hunt due to industrial activity east of Barrow. -Karen Burnell. (Utqiagvik) (MMS 1997)

The whales are very sensitive to noise and water pollution. In the spring whale hunt, the whaling crews are very careful about noise. In my crew, and in other crews I observe, the actual spring whaling is done by rowing small boats, usually made from bearded sealskins. We keep our snow machines well away from the edge of the ice so that the machine sound will not scare the whales. In the fall, we have to go as much as 65 miles out to sea to look for whales. I have adapted my boat's motor to have the absolute minimum amount of noise, but I still observe that whales are panicked by the sound when I am as much as 3 miles away from them. I observe that in the fall migration, the bowheads travel in pods of 60 to 120 whales. When they hear the sound of the motor, the whales scatter in groups of 8 to 10, and they scatter in every direction (NSB, Commission on History and Culture, 1980; USDOT, MMS, 2003a). (Utqiagvik) (MMS 2007a)

And the other thing is when it comes to the sound, we know from our ancestors, from history, from our Inupiat history that they didn't dare go near the ocean once -- they didn't even speak above a whisper because the whales were so sensitive to noise. This is documented. And I just listened to some whaling captain saying -- and I never thought of it when my brother's whaling crew that I'm a part of go down every year, where they urinate, you know, have a little bathroom area there, that this one crew didn't even let it accumulate because the whales and the animal smell was so sensitive. They can smell real sensitive. Dorcas Stein. (Utqiagvik) (MMS 2007b)

3.2.3.2 Noise Levels and Effects Associated with Aircraft

See traditional knowledge provided in the SUBSISTENCE - NOISE, TRAFFIC, AND HUMAN ACTIVITY section for traditional knowledge that is also applicable to this section.

When we had the helicopter and the coal mine open, we had no caribou close to Point Lay at all, anywhere. All year round. For how many years...so then we started making rules and regulations for air traffic for the coal mine so we set down how high helicopters and airplanes could fly, and they're still going on to this day on these studies. Even with the walrus, the helicopters and the airplanes have to stay above 1500 feet or more...after our coal mine shut down, we noticed the caribou migration slowly started coming back, and then I say these past 2 years is the most I ever seen caribou hanging around Point Lay [since before the activity]. Not in herds but just in little pods—maybe 5 pods, 7 pod, 10 pod. But at least they're hanging around now. (Point Lay) (Braem et al. 2017)

Mainly aircraft over-flights. They've kind of been scaring the caribou. Last year I was waiting for a herd coming towards the river. And then that BP twin otter came over, maybe 2,000 feet off the ground, and those caribou turned right around and headed a different direction. (Nuiqsut active harvester; Experience timeline 2006; Experience location: Between Kokumak Channel and Colville. SRB&A Interview 2007). (SRB&A 2009)

There was a plane yesterday that was flying really low that we were wondering about. It kind of looked like Era's caravan, but it wasn't at the right time. We were wondering what was going on, and we got

mad cause there was caribou out there that they were scaring. They were flying lower than the street poles. (Point Lay) (SRB&A 2013a)

Especially in the Alpine area. You can hear them in town. It will scare the caribous. They will be easily spooked for days. They will just start running and keep on running and running. With that chopper it likes to go on the rivers and around here the way the rivers are there are two river split apart and then go together and the caribou are in the middle. And the birds are trying to avoid the activity and noise. (Nuiqsut) (SRB&A 2012)

With caribou, this summer there was a chopper going around. It was about 40 miles west and south of Barrow. That chopper, they were so spooked. The helicopter scared the caribou. Maybe they think all the noise from the rotors is gunfire. When you're out there for a couple weeks hunting and the game keep getting scared off, it gets old. (Barrow active harvester; Experience timeline: 2006; Experience location: Southwest of Barrow. SRB&A Interview 2007). (SRB&A 2009)

Planes. We were at our camp, choppers and planes were scaring caribou. We had to go further out. About 35 miles southeast of here, near our camp. (Barrow active harvester; Experience timeline: 2006; Experience location: small lakes out there [Barrow area]. SRB&A Interview 2007). (SRB&A 2009)

When we were way down by the Chandler area and there was air traffic going on over here at Umiat and that red and white plane of Alpine kept following the river and scaring the caribou like he is doing it on purpose. We have bright clothes on and he knew we were there and he made a couple passes and made the caribou run further inland. That was wrong. Red and white plane. We had the caribou in our sight and plane comes and it took off and turned back around and did the same thing and same path and that pissed us off. Right between those two rivers. Just following the river. We had the caribou in our sight waiting for a good shot and we heard the plane and they just took off. That was in July. Red and white, Alpine. Four boats waiting for them caribou. (Nuiqsut) (SRB&A 2010a).

3.2.4 Renewable Energy

Several traditional knowledge observations in the reports discussed the renewable nature of subsistence resources and the importance of preserving and utilizing these “renewable” resources.

We, the Inupiat people in Atqasuk and the Arctic Slope and Barrow that have survived and rely on subsistence resources to sustain our livelihood. Even today these include the residents of Wainwright because they are heavy users on the renewable resources from Ikpikpuk to Wainwright to Colville River. And we need to maintain these protective setbacks for stipulations on our renewable resources on which we have survived and maintained our subsistence livelihood, and support those persons that are in need of subsistence who are trying to draft these stipulations and protect our renewable resources in the advent of oil and gas exploration in NPR-A. (Atqasuk) (BLM 2004b)

These are the renewable resources that we depend upon for tradition use for subsistence so those are the things that can be funded by these things ____ (59:44.67) gravel roads permitted and potential um renewable resources for our community to protect, enhance our fresh water lakes that have fish bearing lakes. Those are very important lakes and we have to protect in the Teshekpuk area even in the NPRA. (Utqiagvik) (BLM 2019a)

And for those like himself and those of the community need to also voice more concerns to protect our renewable resources, even in lakes where there are no drainages, because these lakes with no drainages have over wintering fishes, habitat fish habitat, that they -- in these deep lakes. A concern besides that is of the early warming weather, the thawing of permafrost can cause some lakes and have early drainages and may cause some lakes to drain even with fish in it, and that that needs to -- those needs are very sensitive, especially lakes that are near ravines or rivers that should not be encroached upon. And that needs to have a more sensitive protection. (Atqasuk) (BLM 2004b)

3.2.5 **Physiography**

See traditional knowledge provided in the WATER RESOURCES section for traditional knowledge that is also applicable to this section including comments on permafrost and erosion.

3.2.5.1 **Permafrost**

There's reports, recent reports, even at Prudhoe Bay, where the permafrost is even affecting the infrastructure with oil and gas where they had to close down wells because of that. (Nuiqsut) (BLM 2018c)

We are dealing with a lot of permafrost subsidence not just in Point Lay but across the North Slope. I'm sure that, BLM should be aware of that. Having any infrastructure put in place there needs to be a permafrost study put in place first to sustain the infrastructure that's supposed to be put in place to allow for the oil and gas. I think that's a must need that if you're going to build infrastructure up here that you need to look at the land underneath it to make sure that it's stable and able to hold that type of infrastructure. Any special buildings where there's permafrost that is subsiding and you are putting infrastructure there if there's special engineering that is put in place, I want record of that special engineering of that infrastructure. (Point Lay) (BLM 2019b)

I am sure that the melting, or the process of making the soil deeper, with the permafrost underneath, the soil is not very deep. There are times when an area has dropped maybe three feet down and there is ice underneath. (Anaktuvuk Pass) (SRB&A Unpublished)

If the sun starts shining on the big rocks, and the sun warms them up, it affects the permafrost when the exposed rocks get warm. (Anaktuvuk Pass) (SRB&A Unpublished)

She was mentioning that there is some water [from melting permafrost]; there used to be areas where it's walkable but now it has some deep water. Even in the midst of those rocks there is a lot of water coming, there's water in those areas. And it's staying there in the summer time. (Anaktuvuk Pass) (SRB&A Unpublished)

About coastal areas, the ice is being affected somehow by the changing permafrost. There are some areas that are not usable anymore; you know, this methane that seeps out of the ground and if its enclosed in a cellar, people have died in there. You can't smell it, you can't see it, and if you breath it you can die. So the permafrost is getting thinner there is more chance of cracks in it, and if ice cellars are down through permafrost and then they aren't useable anymore. And the water level is [higher] and seeping down and flooding areas. (Anaktuvuk Pass) (SRB&A Unpublished)

You probably know how water melts the ice. It eats through it. My experience, I have been going out boating every year and seeing how the land changes. It makes that one area shallow and wider, and the water flows where it can flow the easiest. I have seen a lot of change in the river. It moves a lot of gravel. The routes that we used to use going upriver it used to be pretty deep. Now in my lifetime I have seen the mud move in the river. The gravel and mud will move the water into certain places. There is land, or ground that hasn't been touched in so many years and the mud and gravel will get onto it. Water works really quick on that permafrost. The more it melts the more the ground will start falling in the river. (Nuiqsut) (SRB&A 2012)

If the water hits it, it will erode the permafrost really fast. If it is just exposed to the light it takes a lot longer than if it is exposed to the water. I have seen dry permafrost stay around for 10 years and not do anything. (Nuiqsut) (SRB&A 2012)

No, but those pipelines that go over the rivers, now that will affect the river. There are those pipes that they sink that are filled with Freon and they keep the ground frozen. That is the only place I would see

permafrost aggravation. Seems like they didn't go far enough away from the river. I bet those permafrost things will begin falling over. (Nuiqsut) (SRB&A 2012)

3.2.5.2 Erosion*

We noticed changes in the landscape along the river from erosion. We first had a sod house then a cabin. But we had to move the cabin 150 feet from the river because of erosion. We used to have a cellar located 100 feet from the river that eroded away. There was lots of ice [permafrost] where our cellar was and it eroded away very fast. And the water level is coming up higher than in the past when it used to be east winds. The west wind causes the water to rise. The ice movement was so tremendous that it started affecting the landscape and eroding the bluffs. (Nuiqsut) (MBC AES 2004)

With the main ice pack receding, the storms are affecting our banks -- eroding them. Many cellars have been affected by erosion. If the ice pack was nearby, the storms wouldn't be as severe. We used to have a house with land. After so many storms, the door was next to the bank. (Wainwright) (SRB&A 2009)

The ice movement was so tremendous that it started affecting the landscape and eroding the bluffs. The water level is coming up a lot higher than it used to. (Nuiqsut) (MBC AES 2004)

The erosion is more noticeable down there, at the mouth of the Colville [River] down there, I know. Maybe they aren't paying attention to that. People from Barrow do a lot of boating and they say some of those, where they use to go in the small inlets, some of those are just loaded [with silt] and [they] can't use them anymore. I have no information; you have to talk to them. This part here [mouth of the Colville River], or Nuiqsut maybe has more to say about that. (Anaktuvuk Pass) (SRB&A Unpublished)

One thing you have to know about building anything around here you have to build it in land to make it last any length of time. We notice all the erosion all the time. It's not a new thing. They have always known about erosion. You have to build further away from the river if you want it to last. (Nuiqsut) (SRB&A 2012)

Atigaru Point has been eroding a lot. I used to dock at the point and it never got shallow.... (Nuiqsut) (SRB&A 2012)

... Atigaru Point is now forming lakes and stuff inside the bay too. I see a lot of changes at Eskimo Island, there used to be a small island that was right on the other side of Atigaru Point. Eskimo Island has grown twice or triple as it was back then. It used to be a small island now it is expanding. Either the water has dropped but it is mainly gravel. The high part is tundra. (Nuiqsut) (SRB&A 2012)

Also that side has erosion control because it is on the oil field side. There are big concrete blocks that protect the coastline from the surf. (Nuiqsut) (SRB&A 2012)

...I think it is because of the Colville crossing, the bridge they slot it at the end of the season, it seems to the oil companies that it helps but it is still causing flooding. The water gets so high, I think the bridge, the Colville Bridge is underwater before it goes out. That is probably what causes erosion down that way because of the force of water that is behind it. The currents definitely help with erosion. (Nuiqsut) (SRB&A 2012)

Where there is ice it is eroding and where there is grass on the tundra there is a change in the weather pattern. Particularly where there is ice it will erode. Nigliq, there used to be a big mass of tundra but that is gone now. (Nuiqsut) (SRB&A 2012)

Well, there's been a lot of erosion going on. Our coastline is diminishing every several years, it gets smaller and smaller the, ah, you see these barrier islands here in front of Point Lay here—they're all getting smaller due to erosion from the sea, from the ocean eroding. Even our lagoon area by the village, or all the way up and down, up and down the coast is eroding 'cause more water is coming in and eroding a lot of our coastline. (Point Lay) (Mikow et al. 2016)

3.2.6 Geology and Minerals

See traditional knowledge provided in the PALEONTOLOGICAL RESOURCES section for traditional knowledge that is also applicable to this section.

3.2.7 Petroleum Resources

Same thing with crude oil, guess what we've been using it for thousands of years. It's called _____ (01:15:32.99) oil seeps that go on the tundra that we harvested and there's a lot of historical knowledge behind that. There's some basis for using crude oil just in its raw form for energy on the Slope. It's a prime topic to be talked about in such a way that Arnold described it a little bit ago. (Utqiagvik) (BLM 2019a)

Yeah, like a couple of years ago – two summers ago – let's see, right across here [near Kachemach], I have been going to this lake with my boat but now what we noticed is that there is some bubbles are coming up in the lake and we thought, 'that is not fish; that must be methane gas.' One time I took my nephew in there, we were looking for caribou, and I happened to go inside that creek and when we got to that lake, we saw a lot of bubbles coming up. That methane lake. It is right on his aaka's land. We stay away from that area now. I checked it out this summer, and it is still bubbling. (Nuiqsut) (SRB&A 2015)

3.2.8 Paleontological Resources

Also like to view into the realm of paleontology, and emphasize an area I think it's around Ocean Point on the Colville, where there's a large paleontological site that has been investigated for many years by paleontologists from UAF, I just wanted to point that out as an important area. (Nuiqsut) (BLM 1997b)

The Colville River region is very well known for that. We will happen by the tusks, Ivory, bones. I am quite sure that it is over there. (Nuiqsut) (SRB&A 2012)

3.2.9 Soil Resources

See traditional knowledge provided in the PHYSIOGRAPHY section for traditional knowledge that is also applicable to this section.

3.2.10 Sand and Gravel Resources

See traditional knowledge provided in the PHYSIOGRAPHY section for traditional knowledge that is also applicable to this section.

3.2.11 Water Resources

See traditional knowledge provided in the PHYSIOGRAPHY section for traditional knowledge that is also applicable to this section.

3.2.11.1 Watersheds, Rivers, and Streams

Teshkepuk Lake Area

Teshkepuk Lake is a source land. It is a source land that offers relief, nutrition, rebirth and a health to a culture. It must be respected. This is not your place. It is not my place. So, we must use traditional wisdom here. I did not hear that when I stepped into the room. You spoke of technology, new technology. You spoke of expert science. I want you to leave this room thinking source land. (Utqiagvik) (BLM 2003d)

And the recent clean up that we did out here, there was so much contaminants that the government did a band-aid job. I was there. I was their operator. I had questions for them, but I was never answered. I asked them why are we doing a band-aid job and how many years of field spill -- then I would not want to see that around Teshkepuk Lake. That's our subsistence, you know. There's a -- I heard there's a big fish in there and nobody caught for years. I heard stories of that big fish that come through the ice, and

one day I want to catch that big fish. A big healthy fish, and I wouldn't want it to be contaminated. (Utqiagvik) (BLM 2003d)

Other Rivers in NPR-A

Ikpikpuk River is a migrating river. It migrates. It moves and sometimes it moves 300 feet a season...What is our -- these boundaries that they are putting at a half mile, three quarter of a mile on the rivers, erodes, I mean, you know, there's some real tough questions in there. But we know that the rivers still migrate. You will see how much the rivers have moved within these years, they've moved miles. (Utqiagvik) (BLM 2004c)

The Meade River. You see all the ground falling down in the river. Not just there, but other spots. It's getting wider and wider. You can tell. Especially when it rains. (Atqasuk active harvester; Experience timeline: since 2005 and ongoing; Experience location: Meade River near Atqasuk. SRB&A Interview 2007). (SRB&A 2009)

Underneath the tundra, starting from Tavie's [Daniel Leavitt] cabin on the Mayuabiq, there are a lot of underground rivers. A lot of fish go through there. Those are good fish that come from those underground rivers. Big, fat fish. They're aanaakjiq coming in the mouth of the river. They don't know which way they come from. I've seen them just coming out of the shallow part of the river. They're the best fish from the shallow part of the river. And there's lots of little fish like that. They came from the swamp. They're really good fish. (Utqiagvik) (Brewster and George n.d.)

The people up there would like to see a three mile buffer zone from each side of the river. They don't want to see any roads going across this river. By that, I mean you have three proposed roads going across the Colville and going across Fish Creek on one of these road corridors. There is the initial drilling for the entire NPR-A program that we will be starting soon is based within a few hundred feet from this river. We are adamant and persistent and presume that we should try and stop this because it's one of the most highly prized rivers that we have in the country where the people are concerned. By that, I mean without a buffer zone, where we will protect these rivers, it don't make any difference whether you drill three miles from the ocean shore or fifty miles up the river. It still drains into the entire river stream. Therefore, you have a prevailing chance of destroying the whole river all at one crack. Sam Talak (Utqiagvik) (BLM 1982)

We're pretty much contained here, but rivers that are attached to the Colville [River], those are very important. You know that proposed road [to Umiat]? Those rivers have great value to us for the purpose of not creating, we don't have a lot of fish to talk about but when there are fish they are one of the biggest change of diet, just for a small while. And those are the things that people don't ever look at, and that proposed criss-crossing of those rivers to Umiat, there are five rivers we talk about, and the migratory routes for caribou. (Anaktuvuk Pass) (SRB&A Unpublished)

3.2.11.2 Nearshore Marine

When the weather is warm, [there is an] overflow from ocean, in July. It changes the fish coming in. [I saw that] in [the] last few years. When the overflow from saltwater is coming in [from a west and southwest wind], it coincides with warm spell of the weather. (Nuiqsut) (ABR Inc. et al. 2007)

Before the ice did not break. Now the ice is always breaking. We used to know the currents, when the ice would go in, come out—nowadays, it is unpredictable. (Utqiagvik) (Inc. et al. 2008)

When it's south wind we get high water: South to southwest wind. North and northeast wind, everything gets shallow, except for around this time of year [September]. With a slight north wind [in the fall], it won't get shallow in the [Kasegaluk] lagoon. At the beginning of summer it will look like you can walk across almost. (Point Lay) (SRB&A 2011a)

Dirty water, [Kasegaluk] lagoon, the water will be coming in blue, but eventually it pushes all the dirty water and it will slowly turn blue in every inlet. It doesn't happen all at once. You'll end up with a whole blue lagoon. All the blue water will be by the spit side, first, and then it'll take all the dirty water away from the mainland side and turn it blue. (Point Lay) (SRB&A 2011a)

We're seeing first-year ice instead of multi-year ice. Arctic Ocean is melting. Our ice is melting. (Point Lay) (SRB&A 2011a)

We had seismic on the ocean last year and some fishermen don't catch fish anymore. They blame the seismic and air guns because one guy said you were lucky if you get two fish. That was under ice fishing. Usually you get lots. That's with the qaaktaq. This is why I want them to follow the seismic where they blast and see what it's doing to the animals. It'd be better if they search for oil and gas on land rather than the ocean. That way they can have a better chance to work if something happens with their drills. If they have an accident, this way they can cap it. It's easier than in the ocean. Without affecting our hunting areas. I don't want to see any development in our hunting areas or on the rivers where we go fishing. And the calving grounds and bird nesting grounds and any kind of animal that lives there. Their denning grounds. And without damaging the tundra where they work, or lakes that are connected to the rivers. (Wainwright) (SRB&A 2009)

3.2.11.3 Water Quantity

He's concerned about why a lot of these lakes and rivers are getting too shallow. He's found where they...these seismigraphic testing. He's even seen them at the edge of Tsukpuk Lake and he's...he can't help but blame something like that because there's lakes where they just could put part of a fish net and they will get fish. When they stop for lunch with just part of a net in the water but now even people try with two hundred foot nets and still don't get that much. There is one lake where you can't find any fish at all. Daniel Leavitt, through interpreter. (Utqiaġvik) (MMS 1979a)

The streams, little rivers, whatever you call them, where they shoot out from Tsukpuk Lake, they used to be able to go in boats in those but they can't even go on them. Some of them less than half an inch of water on them. Daniel Leavitt, through an interpreter. (Utqiaġvik) (MMS 1979a)

The lakes are shallower than what I used to know. They're draining out. Or some of them are just flats now. No water in them. The outlets into the rivers have opened. (Utqiaġvik) (Brewster and George n.d.)

There's a difference right now in this river [Meade River]. When I was growing up with my parents, there were thousands of fish here, but now there's fish but not as plentiful as when I was growing up. When I was growing up we used to check the net three times a day and it used to be full, but now they don't get as full. I'm talking about aanaakjiq. When I was growing up this river used to be high tide constantly, but it's draining down. It's getting shallower. That's why I think there aren't as many fish. Since the river is getting shallower here the fish don't come out from the lakes no more. 'Cause there's no more river drainage, or overflow from the river in to fill these creeks. That's why I think there's not as much fish as there used to be. (Utqiaġvik) (Brewster and George n.d.)

I remember when the delta was deeper, in 1940, and now it is shallower. When the water is shallower during the winter, the delta freezes and gets grounded therefore there are not so many fish around. This year there was a lot of west wind and more currents; therefore there was good fishing. (Nuiqsut) (MBC AES 2004)

When it snows before it freezes, it causes slush to block the mouth of the river; we move [our] nets; the current pushes the slush toward mouth, the mouth is shallow; it leaves snow at the mouth of river when the wind comes from the west. (Nuiqsut) (ABR Inc. et al. 2007)

The ice has changed, even Contact [Creek] that comes through the village. Kids use to go to the end of the creek and get little fish, but this fall, but this summer it never emptied; it used to dry up in August. It never happened until October so that affected the ice formation on the river... ...There must be some

warmer water someplace that keeps it running and the water temperature has risen; the temperature of the water probably has changed. (Anaktuvuk Pass) (SRB&A Unpublished)

Back then the river was the same as it had always been. It has never gone down below the level. Today it has changed. The river is shifting and the river is getting shallower and further up there are sandbars that are getting higher and higher. Some of the creeks that connect to the lakes... unable to go in those creeks for fish or whatever they are subsisting for. For the Colville River it is changing a lot. The pattern of the current is shifting because the rivers are not one strait deep way, today we have to maneuver around the sandbars. I noticed that the rivers are getting wider because of the current is pushing the water down river, that current is shifting. (Nuiqsut) (SRB&A 2012)

In 1973 I moved here from Barrow I was originally from Atqasuk and Barrow and we moved here by snow machines. There was nobody over here at that time. One year here, more than that, I know so many times we would take the shortcut to the Colville River using the Putu (main access channel in the 1970s to get to the Colville), today that river is dry. It is all dried up. We used to use that as a shortcut to go way up there. (Nuiqsut) (SRB&A 2012)

I think it was three years after we came from Barrow. It started drying gradually and then it came to a point where it was no longer access to the Colville by boat... Back then we noticed that we used to have massive flooding and that is because there was a lot of water coming down from the foothills and mountains but now we don't see that much of it. One summer we had a massive flood, it changed when we first got here, there used to be massive flooding as time goes by, gradually, it has changed to where it is drying. The water level has really gone down from what it was in 1973. That is why the Putu has gone dry because gradually the water level has gone down. It is not like we have those massive floods like we had in the past. We hardly see that today. It has so changed. It is hot, [in July] the temperature has changed because the sun is a lot closer and the moon is a lot closer to us. July is when it gets really hot. That is about the time of the year when the Colville gets hot, the river gets warmer too. (Nuiqsut) (SRB&A 2012)

Chandler River has changed in the past. It used to have access going in and our but today it is all gone and it is shallow. For some reason it has gone down and we don't have the same access to the Colville we used to. It is all different. It is hard to get to the deeper channels. It has changed from the passed from where it is today. They have a difficult time getting into the river. It is a unique moose hunting area and it is wolf and wolverine hunting area. There are lots of rabbits now. It is an important place for subsistence hunting along with the Anaktuvuk River. Today sometimes we don't have access to go in there but there are areas we depend on for moose and Chandler and Anaktuvuk are important rivers. (Nuiqsut) (SRB&A 2012)

I haven't experienced it, but I am sure that the lake will dry out in that area. With the permafrost. It will make a river to it and dry out that lake. I haven't seen that. The water moves a lot over the ground. It will make its way through. The water won't stop until it has settled. It will flow down until it finds a spot to stop. Once you are on the river you watch it for years and years. There is a lot of difference. My experience going out every year, I look at the land, I like looking and it is changing a little bit. It hurts a little. It will make me go different directions and think about the animals. It bothers me not knowing how to go up again, if I have to buy different equipment or a new motor. It will take a piece of the land and I can't stop it. Every year it changes, every year. The water has to go somewhere. (Nuiqsut) (SRB&A 2012)

With the lakes drying out I don't remember where but we caught a caribou and walked past a pond that was super dried out. It was like a big crack 40 feet away and I think that's why it leaked out. (Nuiqsut) (SRB&A 2012)

I stick by the coast in that area [by Oliktok], but when I go to Alpine I see that the lake they use is getting lower. They use it for everything. It's their main source of water. They use it all the time. They must use them a lot. We have used our lake over here and it hasn't gone down or anything. It has always stayed the same. (Nuiqsut) (SRB&A 2012)

Some of the lakes are drying up further up river, there used to be lakes further up river and now it is drying up and there is no lakes at all. The changing has to be with the weather pattern and whether or not more ice is being exposed on the river. Where those ice areas are the tundra sinks and erodes. (Nuiqsut) (SRB&A 2012)

They say that during winter the water on the lakes and ponds are refreshed by ponds but they are really extracting a lot of water for their use in these camps. I think [community member] has a strong point, how much water these development projects are going to use water. They are important spawning areas out there too. How can they minimize that impact? They are using the river to ice chips to build ice roads and they pump a lot of water from the river to these ice roads every year those are being extracted. The only way to reduce that is to have a permanent road to connect these places. Not just to Nuiqsut but also to the different oil pads. Eventually there will be an ice road to Pt. Thompson. (Nuiqsut) (SRB&A 2012)

I remember my surrounding and growing up around Colville Delta the Colville Delta had not changed, it was normal. The river break-ups were stronger in the 40s and 50s and the industry had hardly been around to destroy or damage the environment. And speaking of wetlands, the wetlands were abundant during the breakup and summer. There were more wetlands back then than today. Today they are getting dryer due to the lack of rain. There used to be an abundance of rain that would feed the wetlands and ponds. The thunder [storms] would bring rain but today we do not have those thunder [storms] that bring the rains. As for the lakes, I cannot speak because I do not know how they are today. Along the coastal line, particularly at Oliktok Point, that area used to be a nice big tundra before it was touched by exploration and today Oliktok is no longer tundra because it was expanded with gravel by the industry. There used to be a small creek but that isn't there anymore because industry has been expanding the point to put drill rigs and buildings... during the summer we used to go to Thetis Island to hunt seals and reindeer seals. There used to be an abundance of seals but today that has changed because the industry is there and they have changed the patterns of the current. It has changed because the oil companies are here and they are destroying the original land and expanding the gravel. Lots of the tundra that was once there are now lost. As far as what the Colville has done in the past, today it has changed. When I was growing up, in the 40s and 50s the Colville was once a big Colville Delta, there were no erosions then. When we came back in 1973 to reestablish the village... We could show you on a map. There used to be a point 5 or 6 miles upriver there was a point but that is gone now. Down towards the end there is a fishing cabin and, on the west side of the bend that area is eroding a lot to. (Nuiqsut) (SRB&A 2012)

Number 1 is: All drilling operations, will take a lot of water. That means the same thing will happen like they did in Sagavanirktok River. They ran it dry, completely dry twice in one year. And, if that happens in the Colville River or any of these places that are printed up here -- like the lakes, the big lakes and river -- if any one of those go dry, the animals are goi- -- the fish are not going to be there. That's destroying the villages. Raymond Neakok. (Utqiagvik) (BLM 1982)

I noticed in the first exploration that some of these lakes, especially Shinmar-Rock have dropped about two to three feet loss of water, a depth which is known to be about eight feet. At the time I noticed it-it went down to about five to six feet -and therefore it cannot support any more fish because a tremendous amount of water has been lost in that first exploration at Shinmar-Rock. We enjoy these fish because we know where they're at -and during the winter whenever we need them we can go and get them but these lakes that I mentioned I would say they are zero fish in them -and even if I was to go in an emergency to survive on these fish I wouldn't be successful. (Utqiagvik) (FEA 1976)

3.2.11.4 Water Quality

What about pumping millions of gallons of water out of streams that cisco depend on for oxygen and habitat? If [there is] no oxygen or a place to spawn, that is different from what they know; they will not go there anymore. When you extract thousands of gallons of water, it changes the temperature of those streams or lakes. (Nuiqsut) (ABR Inc. et al. 2007)

When we get this west wind we get a lot of water, the water gets real dirty. That's the time we try to go way upriver, when we get this west wind. All three rivers fill up. East wind is when it drains out. Same thing. North wind drains it out. Northwest current still comes in, southwest it still comes in, [and] southeast it still goes out. (Point Lay) (SRB&A 2011a)

The lakes have changed, I'm sure there are other areas where activities will certainly affect them. [I am] not too familiar with that [project] area, but things around here like the gravel pit over here. I'm sure they will put some padding, using gravel. Where they get the gravel will affect the area, close to the river. The river will get mudded, where the fish are in that area. The rivers here aren't being affected, but there are, knowing how human activities are affecting the creeks, the small rivers coming down from the lakes. (Anaktuvuk Pass) (SRB&A Unpublished)

Last summer the water near Alpine in the Colville River delta was 70 degrees. What is happening? What will happen if development continues at these rates? (Nuiqsut) (BLM 2003b)

Even [Eleanor Lake] that is here is not usable here, where we used to get ice and get water. We can't use it anymore because there has been too much human activities; you know, skidoos and snowmachines spill oil, and it makes it not useful. (Anaktuvuk Pass) (SRB&A Unpublished)

There are whale bones and old ruins at Pingkok Island. The lands and its wildlife, fish, have changed today. For example, Putu used to have a free flowing channel. Now, last year, it had to be physically channeled. Two years ago, my brother Paul went to fish at Itkillikpaat where he ordinarily fished. He came back with no fish. We used to catch fish anytime we put a hook in. The Itkillik River is now rusty colored. There are even a bridge at Puviksuk. This river used to be glassy clear, as I have known it. These are the effects of past activity. Bessie Ericklok. (Nuiqsut) (MMS 1979b)

3.2.12 Solid and Hazardous Waste*

Mayor Rossman Peetook indicated that that he would like to talk about the area that is being used for NPR-A, Alaska EIS. That area is being used for subsistence area uses and will probably be polluted if the industry takes over the land. He's very concerned about that because he wanted to use the example that the DEW line sites have been left vacant. There's pollution there that's never been cleaned up, and he feels that that same thing will probably be there if the industry or the seismic people use that area oil and gas. He is not against oil and gas leasing. But that he feels that until such time that better technology is available to be used in order to safeguard the area for fish for the caribou, for water fowl, these are very important to the lifestyle of our people. He knows also that Teshekpuk Lake, there's all kinds of various fish there available. And what it would what would happen if something drastic happened there, and then the livelihood of the people that are dependent for subsistence what will happen to them. (Wainwright) (SRB&A 2003)

Down by Icy Cape there's been a lot of reports of sick animals in that area. There's a few people who have gone down there. When they walk up on the land they noticed that there's drums buried in the ground from the old DEW line site. They didn't dispose of their fuels the right way. That's why everybody thinks the animals are getting sick. (Point Lay) (SRB&A 2013a)

Cause of the fast motion of the Colville, that's getting close to where the contaminated buried sites, cause each year, the erosion on the Colville seems to be faster every year. I travel a lot on the Colville during the summer months, especially when the moose season's opened up and we noticed that the erosion, every year it's faster. (Nuiqsut) (BLM 1997b)

Contaminants and drums were found in the rivers near the runway. A lot went in our rivers; that could be one factor to review. (Nuiqsut) (ABR Inc. et al. 2007)

We've got that Umiat, the erosion of the Umiat dump is floating through the river. That's a possibility, that the caribou might have been hanging out at that area. That's where the caribou's actually coming

from. We've been finding containers, material containers along the river, you know? From the Umiat dump. The river actually eroded the ground and the dump is falling into the river. We left it [on the tundra]. (Nuiqsut) (SRB&A 2014a)

But these Air Force sites that were put up all along the coast of Northern Alaska shorelines have put in a lot of trash dumps, machinery that were left behind with contaminations from oils and other fluids that were in them. Also from a lot of the iron and other metals that themselves from corrosion produce a lot of contaminations in other ground and waters—on the coast wherever the landfills were put. Most of them were either on the Air Force sites or a couple miles away. And even the lakes behind our village present today have rotten oil drums in the lakes that are on the bottom and they're constantly corroding every summer when the water and the ice melt, and the water's that the corrosion all over and keep going never stop and that puts a lot of strain on our animals and fish—particularly the birds that we live on. They do their nesting in a lot of these flats and a lot of these lakes and ponds are the home where the birds and other animals that depend on them for survival. And we in turn live off these animals for sustenance, for our food, also for our clothing to keep warm, and also did a lot of hunting for animals that we used for transportation—but this was of course 30 years back but it still was a major concerns back then this contamination that had been put all over wherever we have settlements alongside with DEW Line. (Point Lay) (Mikow et al. 2016)

3.3 Biological Resources

3.3.1 Vegetation

See traditional knowledge provided in the CLIMATE AND METEOROLOGY section for traditional knowledge that is also applicable to this section.

This is an effect. I've seen it. I have to go further and further out to get our food. Our ice pack is getting smaller. Our ice is not freezing. Used to be nine to 10 feet thick, now it's four feet thick. Our climate is changing. It affects our plants, like our salmonberries. If rain is low, it will affect us. We mainly need salmonberries for vitamins. We are mainly meat eaters so we need the berries to prevent scurvy. (Wainwright) (SRB&A 2009)

Berries used to grow in abundance one year and don't grow the next year and now its seasonal, every summer. Salmon berries, blueberries, black berries are growing every summer. Before, there was a break. Seems like the berries are more prevalent, and they grow every summer now. And there used to be a break from year to year. Now there's no break. So the wet summer helps the plants. (Anaktuvuk Pass) (SRB&A Unpublished)

And on the tundra travel, there's always never any snow on the foothills, because I've been hunting up there. There's always -- the snow is always blown off on the top, on top of the foothills because of the wind. And I thought there would have to be a foot of snow or something for the Cat trench to start. And there's always not enough snow so you tear up the vegetation. No matter what you do, you tear up the vegetation because the wind blows up -- blows so much in the North Slope. There is always not enough vegetation -- I mean snow to cover all the vegetation. And that's why I would keep that -- keep the traveling at a minimum instead of extending the days of travel for the seismic crews and the oil companies. I think that would be something to think about too. Because I've seen them plow theirselves right through bushes, those little willows along the creeks. If you break a willow, it takes over 30 years or something for it to grow back. So you've got to keep that in mind. (Utqiagvik) (BLM 2004f)

You look at Pik Dunes up there, you somehow char up the tundra a little bit, and because of the rate of revegetation is so slow, that sand, if you rip open the sand, the desert storm ripple effect can happen. So it's a very sensitive tundra we have. (Utqiagvik) (BLM 2004a)

The changes in transportation has caused a lot of trails and changes to the water accumulation in these areas. There's a lot more ponding in areas that have been used for ice roads and other activities. The

ponding creates crevices in the land and it damages the vegetation. There's areas that were available for nesting and such that get under water after the usage occurs. There's increased concentration to activities from our community because there's diversion from other areas that are already being developed and are being explored and developed. So those increased concentrations from our village are now into the areas of this Northeast NPR-A. (Nuiqsut) (BLM 2004d)

Less berries. We used to go right out here and have berries and stuff. We don't hardly ever see berries anymore. When we go to the traditional spots that my grandma went there are still berries out there. It's cause I used to do that all the time when I was young. Me and my friend would be ptarmigan hunting with slingshots and eat berries at the same time. After a while we just stopped seeing them all the time. I don't really know why, they just stopped I guess. (Nuiqsut) (SRB&A 2012)

The ice roads, when they melt you can see where the road has been. I don't know what they use, they use lake water and make ice chips and spread them where the road is going to be. Then they put regular water on it. I think it's cause it [the road] stays there a lot longer. They just don't grow; it's completely brown where the road goes. (Nuiqsut) (SRB&A 2012)

In Nigliq we used to get buckets of berries and now we hardly get any. (Nuiqsut) (SRB&A 2012)

In the Colville Delta region the vegetation were abundant to the point where you could smell them. Now we cannot smell them anymore. You have to get closer to their patches now to find them. They have been gradually depleting. (Nuiqsut) (SRB&A 2012)

Since we left the Colville Delta region in the 1950s coming back in 1973 I noticed that the changes had already happened. The plants and the vegetation and the berries that grew a lot were abundant and now there are hardly any. The willows, the leaves were edible because they grow in abundance and they were just like having dinner salad and now you don't have those today we don't eat what we would have eaten off of the bush. (Nuiqsut) (SRB&A 2012)

Like the rhubarb doesn't grow anymore. I saw some at Fish Creek but I don't see them anymore. I noticed that when we were young we used to pick rhubarb and eat them off of the shorelines and now there is hardly any. (Nuiqsut) (SRB&A 2012)

They are not really that sensitive; they seem really strong because of the soil. It has a lot of nutrients. You could sell it like miracle grow the soil. It is even better. My cousin was growing a plant that took 6 months to grow, with our soil it grew like huge. The reason is that we have such a short summer. (Nuiqsut) (SRB&A 2012)

3.3.1.1 Shrubby Plant Species

Well you know it is obvious that climate change and development is something that, you know that's happened – 10 years ago you are not going to see these willows growing along the road side but now we're seeing those a lot– and now we're seeing land otters that we don't, we don't normally see coming or new animals migrating up North – that's climate change effects – because of how geographically (unclear) may be. (Nuiqsut) (BLM 2016b)

There are some birch trees growing, and cottonwood. Birch wood or cottonwood trees are growing here. That didn't use to happen. (Anaktuvuk Pass) (SRB&A Unpublished)

There's birch trees, over here [pointing east]. I don't know why they are growing now. We always have alders, they are always here. (Anaktuvuk Pass) (SRB&A Unpublished)

There are spruce trees right here to the south now, just close by. (Anaktuvuk Pass) (SRB&A Unpublished)

3.3.2 Wetlands and Floodplains

See traditional knowledge provided in the WATER RESOURCES section for traditional knowledge that is also applicable to this section.

With the satellite programs, I, too, am very concerned about satellite -- the crossing of the Nigliq Channel, the bridge design, as well as CD-4 as well as CD -- I believe it's 7, the most southern site. Nuiqsut has not experienced, neither has Alpine, what we call the 100 year Colville flood. We've only experienced a 25 year flood and with that 25 year flood, it came very close affecting those areas. Now, with the 100 year flood that hasn't occurred -- and I know you have data of what a 100 year flood might look like, but when we first moved here in Nuiqsut, that 100 year flood -- the whole plains down there was covered except for the hill down there. And we haven't seen that ever since we've been here in the 30 some years we've been here. But, you know, the industry needs to know of these dangers Mother Nature brings out on these sites and areas. There are things that -- you can do all the protections you can do, we can have all the policies and stipulations in places, but when Mother Nature's forces come in line, there's nothing any of us can do to stop her of what she's planning to do. And this 100 year flood will come and it will occur and it will devastate those well sites that will go into the Nigliq Channel. (Nuiqsut) (BLM 2003b)

Every year we get flooding in the Nigliq Channel, and every time at the mouth the ice builds up and carries gravel or sand and then slows down and drops gravel. So every year it drops more gravel and it gets further out. The channel, mouth of the river, is getting shallow. (Nuiqsut, Experience location: Nuiqsut. SRB&A Interview 2007). (SRB&A 2009)

During the break up of Kuukpik River, there used to be floods all the way up to Kayuqtusilik. During the ice break up of 1945 the water level rose 20-30 feet. I haven't seen that since. (Nuiqsut) (MBC AES 2004)

Back in the 70's we used to have major flooding. The whole place looked like an island. You could see the hill over here like an island with water covering the whole land. That will probably happen again in the future when we start getting more snow. (Nuiqsut) (SRB&A 2012)

They used to have really big floods, I haven't seen the river go up that high in a long time. (Nuiqsut) (SRB&A 2012)

3.3.3 Wildland Fire

For some reason the caribou haven't been coming as far east [toward Colville River]. There haven't been as many caribou lately. It's just variability in the migration. They had that huge fire in here a couple years ago. So much smoke poured out of there it might have kept them from coming. I don't know. Maybe they got out of the habit of coming here. (Utqiagvik) (SRB&A 2013c)

And it's just sad to see that also the fire that came in July, how it affected the migration. And we -- we talk with the borough, and they wanted that fire to burn out itself, but it didn't. And like Charlie said, it takes about 50 years to grow them lichens. And where the fire is, I think it burned a lot of that. And we'll just have to see next year where the migration will be. (Anaktuvuk Pass) (BLM 2007)

We do get the effects. It covers the whole Umiat area. Forest fire comes from the interior and over the Brooks Range. The whole village area will be affected by the smoke. You can smell that burning all of the way up here. It doesn't go away right away it stays in the area for a while. Even when the tundra fire up... visibility was zero up there. Majority of the caribou migrating south accidentally turned around and headed south. The moose was driven down river because of the smoke. (Nuiqsut) (SRB&A Unpublished-b)

[There are] fires down south, over there [tundra fires]. Inside the house it's getting stinky from the smoke. You can't see the mountains for two days. Planes can't even make it. [The wind blows] both ways north and south. [We have] east wind and west wind. It goes through the valleys. The mosquitoes come when [there is] no wind outside, [when it is] hot. (Anaktuvuk Pass) (SRB&A Unpublished)

3.3.4 **Fish**

See traditional knowledge provided in the ACOUSTIC ENVIRONMENT, WATER RESOURCES, and SUBSISTENCE USES AND RESOURCES sections for traditional knowledge that is also applicable to this section.

3.3.4.1 **Salmon, Whitefish, and Other Fish Observations**

Whitefish

Mr. Ahvakana: Thank you. Thomas Itta, Sr. was born and raised in the vicinity of Teshekpuk Lake, Cape Halkett is the place where he was born. Ever since he could remember he used that area for subsistence hunting. And all those lakes that are there visible, all of them, have fish in them. And he also stated that all the rivers that are around Teshekpuk Lake all flow into that lake and , therefore, they do have fish also. That Teshekpuk Lake from the beginning that we could remember that's been passed on by--from generation to generation. Our forefathers had stated that there's fish there that nobody knows that exist in that lake. (Atqasuk) (SRB&A 2003)

Get qaaktaq in the Kuugaagruk River [Inaru] around December, although that's getting late, it's getting too cold. The qaaktaq come up the river later than the other fish. They're milling around and then they decide to come up later for some reason. We don't get a whole lot, like they do in Nuiqsut. In October on the Chipp River, you can catch qaaktaq going upriver. You can catch more of them later in the season, like December or January, rather than in October. I don't know why they do that. Maybe they're out on the coast and then they come in? You can get qaaktaq in all of the river drainages, including Chipp, but only a few of them. You get them, but not a whole lot of them. We get the ones that are going up river in October. I haven't seen any with eggs then. Although have seen qaaktaq in Nuiqsut with eggs starting to grow in them. Maybe they spawn in the springtime so in the winter when they're being caught the eggs are just starting to grow. Then they will be bloated with eggs by the spring. (Utqiaġvik) (Brewster and George n.d.)

Food for qaaktaq is less. They used to have shrimp in their stomach in the past; now it is like they are eating mud. (Nuiqsut) (ABR Inc. et al. 2007)

Before industry came, they [qaaktaq] were always healthy: size was larger, the amount of fat was higher. After the causeway, they are smaller, unhealthy, their food is unhealthy; they are eating something different. In the past, they had shrimp in the stomachs, when they were caught before the causeways were built. (Nuiqsut) (ABR Inc. et al. 2007)

I get qaaktaq at the mouth of the Chipp River before I go home, before freeze-up. I use a three inch mesh net. I also get them at the mouth of the Alaqtaq River, where it enters Pittalugruaq Lake [Pittallukruak Lake]. Also, I've seen qaaktaq all the way up to Chipp 9. I've caught them in my net. I've caught them up that far. We eat them fast. They're choice fish. (Utqiaġvik) (Brewster and George n.d.)

Qaaktaqs are known by their white fins. They don't have a black tip. The large cisco are blue. And it looks like you couldn't see the scales. And they're about that thick. There used to be a lot of them when I was going up to my camp. Back in them years when I'd go with a canoe I would sometimes get started too late. And I just go around the Point [Point Barrow] on the other side, towards the [Elson] Lagoon side. And then drop my net from the boat, along the edge of the boat. By Nuvualuaq [Plover Point]. But you have to watch closely because there are a lot of seals and loons and other animals going through that deep channel, including walrus. (Utqiaġvik) (Brewster and George n.d.)

The boundaries of paikjuk doesn't go beyond that area that's west of Alaqtaq. I've never seen it beyond that. That's kind of why I protected that area from seismic. I didn't want to lose sight of that only fish that I know called paikjuk. It's a beautiful colored fish. They are located only in that area. By Warren Matumeak's. Alaqtaq. From here, going over toward the Tasiqpatchiaq. I went through there one time before there was this break into Chipp River. And this old man that fished here talks about them and he goes up into the Chipp River up to where Charlie Edwardsen was fishing then, too. And Paul Kignak's camp. East. I've never seen them west of the river. But the west of the river, those fish become to look like lake trout family. Some big

ones. And the aanaakjiq up where those lake trout were, were different color than the ones we were getting at the river. I don't know if they can spawn together maybe. I don't know if lake trout can participate in that. That large lake near Chipp 2 contains the smaller ones. And you can kill them in three inch mesh net. They're beautiful fish. I like them. And they're right up over in that area. Along with Alaqtaq. And that was the reason I was opposing making a landing field for delivery of diesel on those lakes. If they destroy those fish and they don't live in any other area where we know them and we can't ever find them in any other place, then I don't want them destroyed. Also the natural habitat is being destroyed by natural erosion of the river and other areas where you can't protect anything when that happens. If the river breaks through, it breaks through those lakes containing some species of fish. Some with lake trout. (Utqiagvik) (Brewster and George n.d.)

I know these lakes, rivers and lakes, but I think this is the one that I heard so many times to be a subsistence spawning area. This little lake right here, [Chipp-Ikpikpuk Report, AB-19] it's a spawning ground for those fish, and they know it and when they spawn they go and pick up a lot of fish, you know? And they just go in there and get grayling and whitefish and all that spawning and they just mingle in there and get them. (Utqiagvik) (Brewster and George n.d.)

There are lots of fish in Qaababvik. At the mouth of it. We used to go there while traveling and needed a safe place to wait for good weather before crossing Dease Inlet. And we'd fish there. We'd get aanaakjiq [broad whitefish] and lots of iqalusaaq [least cisco]. (Utqiagvik) (Brewster and George n.d.)

The Chipp River is known for aanaakjiq, and also for burbot [tittaaliq] and iqalusaaq [least cisco] and those little humped whitefish - pikuktuuq. There are many in those areas where they seek burbot and grayling. They follow the spawning of aanaakjiq every year. Boy, you catch those with a hook, the pikuktuuq and the tittaaliq. They just follow the spawning run of the aanaakjiq. The Alaqtaq River is good for whitefish. It's good fishing in summer until July. By last part of July they're starting to disappear. We know they're moving someplace. So, all those lakes in there between Alaqtaq and Chipp River are mingled with those fish, with aanaakjiq. And they don't have to be deep, as long as they are about seven feet deep. (Utqiagvik) (Brewster and George n.d.)

The biggest fish I've seen are from Tasiqpak. The ones that are fat are right from this area. I think that some of these spots are fifty feet deep, and they contain big fish -- aanaakjiq. All of our nets were too small, when they got tangled up. But this guy had a very unusual net, made with three mesh deep. It was a big one. And he would make his own nets. And he'd get two fish, it was more than enough of a load for him to take home. The fish were big. And me and Tommy Jr. went up going through west Tasiqpak [showing on map] -- this way I guess. In this one lake. It was deep water. It was about fifty feet. And the aanaakjiq were big. And when we started to pull the net in it was moving like mad, but when we got it out, we got only two or three fish. Big ones. And five fish was pretty near a sled load. There are big fish down there. The biggest aanaakjiq I know about came from the Mayuabiq River. This was Elavgak's grandpa. Daniel Leavitt's mother's grandpa. He had one net. One fish was enough for him. He would drag it home like a seal. Put a rope through the mouth and pull it over his shoulder; you know just like dragging a seal home. It was that big. One fish filled the net. (Utqiagvik) (Brewster and George n.d.)

Char and Other Freshwater Fish

Most of the lake trout I've seen outside of Tasiqpak are in deep lakes. They don't stay in the shallow lakes. Where lake trouts are found is usually an impossible area for the fish to get in. They don't escape to travel like aanaakjiq do. (Utqiagvik) (Brewster and George n.d.)

In Barrow, in August, the fish along the coast are coming from the east. One time I saw the water churning off the beach and it looked like Iqalukpik [dolly varden char]. They're good eating fish, so after I saw them I put a net in and got some. I put the net out in front of NARL [along Chukchi Sea coast]. People don't know this. They put their nets on the Elson Lagoon side for aanaakjiq, but the dolly varden are traveling out on the other side. I've seen them at Point Barrow, too. In Point Hope, they put a net out from the shore at a 45

degree angle and wait for the fish because they are traveling along the edge of the shore. So that's what I was doing. (Utqiaġvik) (Brewster and George n.d.)

There are some underground rivers around the middle of Teshekpuk Lake. There's the shallow part and they have rivers through there. They call them rivers. That's where the fish travel. The big fish, the thirty-five pound lake trout, are in those deep channels. (Utqiaġvik) (Brewster and George n.d.)

This certain place where they used to set up their nets is by where we put cabins in on the Tupaabruk River [Tupaabruk 2 area, see Figure 96]. There are three houses there, plus Mary Lou Leavitt set up a house across from our houses. We put the cabin there because it is a good fishing spot. We put the nets out around the bend and they catch all kinds of fish. Besides at night when we want some burbot, we can just go fishing. It's close by. (Utqiaġvik) (Brewster and George n.d.)

Tittaliq [burbot], that's the Meade River, at Atqasuk. The real Atqasuk. That's what they call it, Atqasukiak. The real place, before they moved it to the village. Winter ice fishing. And we get the qaaktaq at the same time, and the humpback, the pikuttuq. Right at this creek, right there [Usuktuk River]. A lot of burbot, big burbot. The biggest one I got was this long and this wide. (SRB&A Barrow Interview March 2006) (SRB&A 2010a)

And when I go up inland, go fishing, you start getting catfish. Those are unusual in our rivers up inland. You start getting these catfish. And those catfish are always on the ocean, not on rivers. Johnny Aiken. (Utqiaġvik) (MMS 1982)

Now, the Elders up here warned us about what happens to our food chain when they get -- it gets destroyed, and we look at -- you know, that sound down there, and the herring hasn't come back yet. And what is the herring? The basic food for most of the animals that are there. You destroy that kind of fish up here, my seals are gone, my walrus is gone. And if you destroy the lower part of the food chains, well, America, you will have finally achieved your goal, to destroy the Arctic whale. You tried it in the early 1800s by overharvesting it. Now you are going to pollute it. George Edwardsen. (Utqiaġvik) (MMS 2009a)

Salmon

I think all the estuaries are major spawning. I get a lot of salmon fish in the lagoon. I get coho, chum, pink, humpies, some [Arctic] char once in a while, and in August King salmon. I've had a net out right at Kokolik mouth, and I was getting Least Cisco in there one year, and I used a small net in the fall time, August and September. (Point Lay) (SRB&A 2011a)

Salmon, they never used to come up here. In summertime, by our cabin, I got a net. And it started getting some salmon. Dog [chum] salmon. Real big toothed ones. Not very many of them. We never used to get them, but now we do, so maybe they start moving from someplace. (Utqiaġvik) (Carothers et al. 2013)

Kukpowruk and Kokolik are our important spawning grounds [for] the salmon, the grayling. When I first came there was a lot of fish bones on the ground. Past Niklavik, [it is] just graylings. (Point Lay) (SRB&A 2014b)

I think our prevailing wind has changed to the south, southwest. It's been dominating the winds have been dominating from the south and southwest. It's warmer air and high tide in the lagoon and it's not favorable for salmon fishing. The current has to be going out when the salmon come in. (Point Lay) (SRB&A 2013a)

3.3.4.2 Fish Movement Patterns

Lakes and Rivers

And when I thought about that and I -- if you looked at a picture of the whole North Slope from the Canadian border to Point Hope, you look at where NPR-A is and the central part of the North Slope, there is thousands of lakes and lots of little creeks and rivers. That's where the majority of those lakes

are. And what that tells us is that that habitat is so critical to fish. You know, you could see there, all those lakes that have fish in there, that's just a snapshot of fish that, you know, they identify as fish bearing lakes. But listening to elders in my family, even biologists who study fish on the North Slope, that these fish, they move from lake to lake through streams, through creeks that are seasonal. They might not be there year-round. And if you build roads in these areas that don't have a river, like a permanent river, but you're going to block their connection between these lakes, from moving from river to lake to ocean or whatever it may be. And I don't think there's been enough research to document that. So you need to seriously think about how that's going to impact the habitat of the fish on the -- in that area of the North Slope. (Utqiagvik) (BLM 2004f)

Wind in Teshekpuk Lake affects the fish. When it's ufalaq [west wind] they never come. There are no fish there. When the wind is from nigiqaq [the east], that's good. That river [Mayuabiq] is so different when it's east wind. The water gets better. But when it's west wind the water is low. In our area around there, Mayuabiq, when it should have lots of water at ufalaq, it's different. The water goes down. I think the wind pushes the water from Tasiqpak. (Utqiagvik) (Brewster and George n.d.)

Also we've mentioned before that we're now moving in to the heart of the broad white fish, the ahnalik center of distribution and population density, and these fish have a complicated lifestyle that requires use of several types of habitats: lake habitat, deep river, spawning habitat, small ephemeral streams for accessing summer feeding areas - they go out in the near shore area - and all of those different habitats are used in different parts of their life cycle. So it's important when building gravel roads and structures not to impede even very small streams in order to retain healthy populations of this fish. (Utqiagvik) (BLM 2003a)

I notice that these fish we have, the white fish, have not migrated out into the ocean, they just migrated back into these lakes and stayed there for the winter, they are locked in for the winter when they get there. Some of these lakes that I named as the rearing ponds are also the wintering areas for these fish. (Utqiagvik) (FEA 1976)

The area around the lake ... is all flat tundra. Every spring, at break up ... all the flat tundra around the lake is very grassy and when the water level rises, the low-lying areas with dips and hollows become flooded. That's when all the pike go all over those grassy pools. When people are short on food, they would go fishing for them. They are ideal for dog food (Arctic John Etalook, pers. comm. 1981) (Anaktuvuk Pass) (Spearman and Nageak 2005)

They are real resilient fish. They go up these streams [the Miluveach River and others off the Colville River] and right up the waterfall, and they feed off the waterfall. ... It depends on the season [what the fish eat]. Like late August, early September, they feed on beetles. ... [Also,] we have little stickleback that graylings and the other fish eat. (Nuiqsut) (HDR Alaska 2015)

The big run for iqalusaaq is in the summer. In the wintertime, you can put a net out under the ice and get a lot of them. We'd go to Kuugaagruk [Inaru] River for that. We used to eat a lot of those iqalusaaq and then feed them to our dogs, too. (Utqiagvik) (Brewster and George n.d.)

There's usually two to three weeks of a fish run in the fall. Just when the ice is forming. Aanaakjiq, iqalusaaq and pikuktuuq they come together. And sulukpaugaq. They all run together. Our belief is that after the rivers begin to form ice, the fish are heading back in up towards the inland area into the lakes where they came from. (Utqiagvik) (Brewster and George n.d.)

The Alaqtat River is good for whitefish. It's good fishing in summer until July. Last part of July, they're starting to disappear. We know they're moving someplace. They're heading up to Chipp River. We know exactly the route they are taking to go up there. They go through Tasiqpatchiaq. And go through Pittalugruaq one time. But the river has broken through to Chipp River and is flowing this way now. It still flows out, but the channel has built up [increased water flow] and it's deep water now. And there are those streams that flow into the Chipp River and other main rivers. There're some streams like Tittaaliq, Aumalik, Qaksrabavik and Qubafnaq and stuff, but those are up in the headwaters where the water is coming from.

There has to be enough water up there that they continually flow in the summer without letting up. So the fish are going up there, too. Those little fingerlings are the ones that go through those, too. And there are some lakes up there we know where the grayling are found, where the fish will go. And then four or five years later the big ones that are ready for spawning. Male and female. They go down. And you are tagging them coming up. They go from Alaqtaq area and then go in there. Those that are spawning grade are going up. And in the fall, just before around freeze-up, they stampede back down to spawn in those qaglus. Same thing, going up or coming down to spawning, I imagine those fish know where to go for spawning. Now, some of the things you didn't catch out. All the fingerlings don't go all the way here. Some get lost. The majority of them, they go into these bays. When the break-up pushes them all out, they have to go somewhere. They run around, probably escape predators. The only way they will reproduce is in these lakes. (Utqiagvik) (Brewster and George n.d.)

Fish in the lakes, the small ones, are in the rearing ponds. As they grow into big fish, big enough to spawn, early in the spring they stampede out while it's high water. That's when we get some good fish. I like to be there to catch some of those. They already have roe. They are not prime, not ready to spawn out, but they are there. The eggs are glued together. You can't separate them easily, like you would at spawning time. During spawning time, you just squeeze the fish and the eggs pop out. Sometimes we have to clip the tail end to leave the eggs in there and then freeze them that way. All the fish [ones in rivers and ones that had been in lakes and moved to river through streams at high water] go to the headwaters of the Chipp River in the summer. They head up to the headwaters. How far up? I've never made it up to the very end of the Chipp River, but I have gone a ways up. Even tittaaliq and grayling go that way. In the fall, the fish are coming down the Chipp River for spawning to the deep water. There are deep water holes in the river where the fish spawn [qaglu]. Those fish know what they're doing. I think they know that during spawning they want to come down with a spawning group. If the run is good, the majority will go down towards the bay, and to qaglus where they spawn. (Utqiagvik) (Brewster and George n.d.)

Nalaakruk Lake has really good, tender fish. It was different. I think the oil companies used that water and it's really different now. The water looks different, they say. Our son [Billy] usually goes there for a few days in the fall and gets real good fish. They are different than the river fish. Aanaakjiq. (Utqiagvik) (Brewster and George n.d.)

In the 1930s, '40s and '50s, we usually ended up fishing on October 6. We started around September 23rd with a dog team traveling through snow and ice crossing small lakes that were already frozen enough and useful for traveling. We knew the fish run would start around September 25th or 26th. The fish don't miss that. We have to be there to catch them, otherwise after five or six days the run is over. And if you don't catch them then, you don't have much subsistence food to put away. Today, it runs all the way into October, 10th or 15th. (Utqiagvik) (Brewster and George n.d.)

Six days before spawning, seven days at the most, that's when I want to arrive at my fishing spot on the Chipp River. That's why I have to be there. You have to catch the fish run when it's happening. After the 10th of October, it makes no sense. The run is over. Right now, it's changed to the 10th. The run used to be from September 26th on down to October 1st. It's ten days difference now. I figure the change of climate or some measure of change has to do with it, because we have a late freeze-up today. In my younger years, I would go ice skating maybe on the 15th of September. And then the reindeer corralling time would be the last week of September. And the ice would be that thick and it was just right for making a huge ice corral. We put all the reindeer into that. So that's the difference today. I mean somewhere around October 8th or 10th, up to there. In those two areas, I would pull all my nets out. No matter which way you look at it, spawning has to take place. I don't know if the fish can hold off that long. (Utqiagvik) (Brewster and George n.d.)

Nearshore Marine

When the weather is warm, [there is an] overflow from ocean, in July. It changes the fish coming in. [I saw that] in [the] last few years. When the overflow from saltwater is coming in (from a west and southwest wind), it coincides with warm spell of the weather. (Nuiqsut) (ABR Inc. et al. 2007)

The Arctic cisco and broad whitefish always come in [on the eastern side of the mouth of the Colville River]. A lot of animals like bearded seal, [ringed] seal, and spotted seal begin coming into the river from the ocean during the time that it is continuously dark. Also at the mouth of the Nigliq [Channel] is where bearded seals increase in numbers in the darkest months of the year [early winter]. ... We get seals, bearded seals, sea lions do come in there near the mouth of these channels to feed on fish. And they do hunt in those areas: Colville Delta region all the way to Nigliq and some are in Fish Creek area. They're abundant in August-September. That's when the fish start coming in....Some do come in way inside somehow....I got ugruk [bearded seal] by Kayuqtusiuk...It was around with a lot of spotted seals. (Nuiqsut) (HDR Alaska 2015)

It is noted of 28 species of fish that comes over winter and have them -- and half of those fishes winter in the Colville River. Like the Arctic cisco is a migration fish that spawn from the MacKenzie that has been pushed through the current until they are three-, four-year-old. By that time they are in our river system. But there is fishes that comes in the river. That's why we are worried what will happen. (Nuiqsut) (BOEM 2011)

I have fished most of my life and have noticed that the fish follow the currents. During the summer months we would never have to leave the shore to catch fish. I also remember that most of the Arctic cisco caught during the summer had eggs within them. Starting in July when it starts getting darker, they follow the salinity of the ocean. They never leave the shoreline in summer. The families used to fish where Helmerick put his cabin. Once the causeway was built, the seawater treatment plant, changes began to occur. These changes affected the size and abundance of fish. (Nuiqsut) (MBC AES 2004)

In older days, with a west wind [we] hardly caught any fish, but today we catch most fish [in a west wind]. In the past, the west wind used to push fish out, whereas today, we depend on the west wind to push the fish in. (Nuiqsut) (ABR Inc. et al. 2007)

In the beginning of August, the Arctic cisco turn around and start moving back into the river. Large fish seem to disperse a long way east and west from the Mackenzie River. Other white fish from the Mackenzie peter out at Herschel Island. Other fish from the Colville peter out at Flaxman Island. But Arctic cisco are found all the way along between the Colville and Mackenzie. (Nuiqsut) (MBC AES 2004)

The reason why I had my sons pull out all the fish nets in December was it was an unusually different weather pattern this year [December 2003 - February 2004]. It was hardly below zero until December. [On the rivers] the salt water will flake up, and there's flakey ice that looks like maybe the fresh water is coming out from the river or somewhere. It forms paper-thin, and is real sharp and then it moves. But in the salt water it is in a different form and it will collect easy on your net. And it will float the net no matter how much weight you put on it. It collects so fast through the current that I told them that happened to me more than once. So you might as well pull the nets out, because I think you're going to have a bad situation trying to pull them out later. Because I know, I've done it before. I got caught in it. Got caught twice, it's enough. And then I remember it. (Utqiagvik) (Brewster and George n.d.)

3.3.4.3 Health and Physical Abnormalities

The fish we get, the cisco—it seems more contaminated—like chemicals are eating away at it, not that another fish had taken a bite out of it. There are big sores on fish, and some are deformed. You see this especially on the belly and tail. They have pale-colored meat, the color is reddish. You have to throw it away; you can't even feed it to the dogs. (Nuiqsut) (McBeath and Shepro 2007)

When I started seeing dark spots in the liver [of burbot], I, I mean I ask questions. 'Cause I know for a fact there's an old dump site just a few miles upriver and lot of it is toxic. So might have something to do with those dark spots showing up on those livers 'cause the liver of a burbot is our delicacy. I mean it's probably the best part of the fish that we go after. But then after start seeing that dark spots in the liver they might start shying away. Start telling my boys no more from that place. (Nuiqsut) (Brown et al. 2016)

They are smaller, skinnier fish now. I have a picture taken in 1973, when things were different. Fish are very small now in the channel compared to thirty years ago. Then people caught from two hundred to six

hundred fish per net per day. Now we get one to thirty fish per net per day in the same area, on a good day. (Nuiqsut) (McBeath and Shepro 2007)

She said that she was raised here and she's been living here, and over the years she has personally consumed qaaqtaq, Arctic cisco. And the liver is a delicacy for her, but over the past couple of years there has been discoloration of the liver in Arctic cisco. Although the fat contents are still evident, there appears she hasn't had any liver from the qaaqtaq for the past two years because of the discoloration of the liver from its normal color to a darker, blackish color in some cases. Flora Ipalook, translated by Delbert Rexford. (Nuiqsut) (MMS 2007c)

In the 1970s [the] fish were healthy and you could cook all of those fish and [the] taste was good most the time; now, the fish has changed, the taste has changed; even the fresh fish they catch today tastes like it has been in the freezer for a long time, freezer burn. (Nuiqsut) (ABR Inc. et al. 2007)

3.3.4.4 Effects of Seismic on Fish

In the wintering years when ice gets thicker and the waters and the fishes are even more sensitive because the ice, the more ice there is the water becomes more dense, so much that it's -- any little sharp noise or bang of those effects can kill fish. And included one incident where when there was fishes site on a clear day you can see it clear, but under the water and - and for -- not for it to be lost, the ice is 10 to 14 inches and you can slap that with a -- like a bang and cause that fish either to die instantly and those are known types of things that have killed the fishes and especially when the ice is thick, because the pressure of the ice makes that water more dense and easy to kill the fishes. (Atqasuk) (BLM 2004b)

He said they were sounding along the river bank by Kuugagruk, and put up poles all the way by the river banks. And, they were sounding there ever since the fish were scarce. All the other rivers drain to the ocean, and when there's Spring breakup, then all the debris and everything that's in the river goes out. But, Kuugagruk happened to be different than those other rivers, because it does not flow out to the ocean. And sometimes, the debris will collect in that river because the oil companies had been doing some testing there. After they did that, there was lot of dead fish along the along the river banks, like they were just a long line of wood that they gather from the bank of the river, sometimes. They said the river banks were just full of dead fish after those testing on that river. Noah Itta translated by Alice Solomon. (Utqiagvik) (MMS 1982)

And, as told in a comment made by an inland person earlier, he said his father would kill fish by hitting (the ice) from the top, and if there is ice-free water under there the fish would die. And then he would make some holes in the ice down-current for the dead fish to float up through. This, (his story) is also true. This is how the (people) that are drilling, using explosives on land during the winter near the lakes, kill the fish. And also in the ocean when they are using compressors, it is no different. A person saw this with his own eyes and knows that just by hitting the top of the ice the fish would be dead. A compressor which sends off a very loud noise (and vibrations) can also kill a lot of fish. (Utqiagvik) (SRB&A 2003)

Due to the ships traveling about we didn't get any whitefish this year. Usually we get plenty. This year, with all the ships dragging seismic equipment, we didn't get any fish on our river. (Wainwright active harvester; Experience timeline: 2006; Experience location: Kuk River. SRB&A Interview 2007) (SRB&A 2009)

And he's more concerned about the east -- the lakes east of the Ikpikpuk because they are filled with fish, and he's very concerned about these for wintering and seismic because these are the Community of the Arctic Slope, Barrow, Atqasuk, Nuiqsut and Wainwright, they still rely heavily on the nutritional supplements from subsistence, and renewable resources especially in these fishes -- I mean, lakes where there are fishes. These are known, you know, for to supplement the dietary and nutritional needs. And they need to be heavily protected. There is not much more else that we can rely on other than our renewable resources that is just so sparse right now, but being on the whim of extinction, on especially in the advent of seismic and oil and gas exploration. (Atqasuk) (BLM 2004b)

During the course of early seismic testing during that oil exploration, the blasting of the dynamite gave a good recording. But they were destroying all of the fish. The only way we found out that we were destroying fish was in the springtime during break-up when it produced dead fish on the surface. Seagulls enjoyed them all, I think. But the seismic was responsible in them years by using dynamite. Today, they've got different methods. We made a report on that. I was fishing and working for the Navy. By testing dynamite in the river, I learned that I killed a whole bunch of fish. I was part of them, working for the Navy - and I didn't even know it until one guy mentioned that Tasibruaq Lake fish were gone, and there's so many fish on the edge of the lake. They blew one, two, three charges of that dynamite there in that lake. It had some effect too, probably even poisoned rainbows, killed them by concussion, I don't know. (Utqiaġvik) (Brewster and George n.d.)

Noise bothers the fish. Seismic crews in the early days used dynamite on fish bearing lakes and rivers. Norman Leavitt said he saw lots of dead fish on the Kuugaagruk River [Inaru]. That's sad. The state allowed that to happen. We had no say. Now they've developed a vibrosis method for seismic surveying, shaking, that doesn't hurt anything because it's gradual not sudden. (Utqiaġvik) (Brewster and George n.d.)

My next-door neighbor he mentioned at the time he was up in the fishing area near Alaktak that the dead fish were on the edge of the lake that the seismic had got to during the winter. They did tremendous damage, not only at the lakes that I pointed out but also some other lakes around the area - all these lakes that are ten feet, eight feet or more. There's - or was a tremendous amount of fish in these lakes - one lake has more than three species of fish. (Utqiaġvik) (FEA 1976)

A compressor which sends off a very loud noise (and vibrations) can also kill a lot of fish. An elder (made a comment) to stop (the drilling for five (5) years.) since we, ourselves are elders now. I will support his comment to stop (for five years) to see if the animals will return to (their habitats); I am glad to know that a person thinks in this way. If they are going to drill near the river, don't use the water in that river. The (abundance) of fish will change. (Utqiaġvik) (SRB&A 2003)

This year my husband went fishing. He only took home two whitefish. Not like years past. Ever since the seismic, anything that has to do with noise. They've done some sort of search up by our cabin on the Utukok River. We did not get very many fish. If they stop the seismic, maybe they will come back! (Wainwright active harvester; Experience timeline: 2006; Experience location: Utukok River. SRB&A Interview 2007) (SRB&A 2009)

We never see those fish anymore through here. I think I know why. One of these seismic people, they were sounding in this area, all the way up here. When they dynamited that down there, they blocked that road for the fish when they come up that way. We never get anymore. Last year, was the same way. It's been six or seven years now since we ever catch any. In the summer, sure, we get a little bit, but not too much. Sometimes ten, twelve fish in one net. But, we used to get a lot of them. We have to come out in here, where Noah Itta's place is. We can get our fish in the summer right there only. That's the only place in the river in this area that we can get fish. That's aanaakjiq. (Utqiaġvik) (Brewster and George n.d.)

And he's concerned on fish in lakes and rivers over wintering areas and seismic. Sometime ago they had been involved with the -- working with seismics before and it has devastated known wintering areas near here and Ikpikpuk. And these were -- these are dynamite things and they know that this does kill and devastates fishes, stocks of fish, many of them and many known over wintering areas. And he's -- and perhaps on account of those that the setbacks, maybe that may be warranted to be even a little bit more to -- rather than relaxing them in all the ravines, including rivers. (Atqasuk) (BLM 2004b)

This year my husband went fishing. He only took home two whitefish. Not like years past. Ever since the seismic, anything that has to do with noise. They've done some sort of search up by our cabin on the Utukok River. We did not get very many fish. If they stop the seismic, maybe they will come back. (Wainwright) (SRB&A 2009)

3.3.4.5 Effects of Development on Fish

I believe that sediment studies along the DEW line should be looked at. Nowadays, the fish are skinny and not fat like they used to be. You should look at those problems from the past. Perhaps the fish have an altered migration path in order to avoid contaminated areas. Maybe they migrate out in the ocean farther. But there is something that is causing a change in their migration route. They are traveling longer distances and that is evidenced by the fact that they are not as fat as usual. (Nuiqsut) (MBC AES 2004)

It is a lot of work to go out there and chisel ice and coming back the next day to check the nets and there is only one fish. It was really sad last year. I barely made a half a sack of fish. When we caught fish, we send some to Barrow. Last year we sent three fish to Barrow and two elders fought over them. This year they are happy with what we are catching. We are able to send more. I hope it gets better. I feel the decline in fish occurred when development began. It has really declined after three years of construction of the HDD (horizontal drilling under the river) near Putu. This year they drilled at Iqallipik (Fish Creek); we didn't catch many fish when that rig was there. Now that development is slowing down, we hopefully will see the fish counts increase. I believe noise and development are the cause for the decline in fish counts. Prior to development there were no complainants with the fish counts. First there was Alpine and then North Star. (Nuiqsut) (MBC AES 2004)

I am concerned with industry building more and more ice bridges every year. They build these ice bridges over the rivers of the Nigliq Channel as well as the Colville River. These ice bridges are used to enable rigs to travel over the river in order to reach the drilling site. These ice bridges are built in December and January. My theory is that late in the season, with the building of ice bridges, migration routes are being blocked. With ice bridges being built across rivers, it naturally forms ice underneath. By the time the ice road was done in April we found about 70 feet of ice formed beneath the bridges and only about five feet of open water left at the bottom for the fish to pass. That practically covers the whole river and prevents any wildlife or fish to pass the river at these areas where ice bridges have been built. I would like a study to be done to determine if these bridges are being grounded to the ground. I feel that the bridges affect the fish greatly as well as the community. Industry says no, we need the oil here, but further studies need to be done to do it right... This is a concern because the fish travel within a specific temperature of water and a specific depth. When the ice forms and blocks those specific areas they will turn around and go back or elsewhere. They probably will not go underneath and figure it out. A similar situation is seen among the caribou and the pipeline height. When the caribou encounter the pipeline they will turn away and go somewhere else. They will not stop and think that perhaps nearby there is a crossing path that could be used. With the forming of ice bridges I believe that the fish that encounter it will turn around and go back. I don't think they will go under it. (Nuiqsut) (MBC AES 2004)

The effect of outboard motors on the fish is the noise. Any time you create noise, it's going to effect the fish. That's why when you put out a seine net, you use a rowboat. Fish are closer by if you don't use an outboard. They scatter from the motor noise, but they come back. (Utqiaġvik) (Brewster and George n.d.)

When there's noise from people walking on top of the ice or people traveling on top, fish like tittaaliq move away from where the people have made a trail. Now they don't stay around there when there's noise. When there's noise, they're more afraid than other fish. (Utqiaġvik) (Brewster and George n.d.)

I feel the decline in fish occurred when development began. It has really declined after three years of construction of the HDD (horizontal drilling under the river) near Putu. This year they drilled at Iqallipik (Fish Creek); we didn't catch many fish when that rig was there. Now that development is slowing down, we hopefully will see the fish counts increase. I believe noise and development are the cause for the decline in fish counts. Prior to development there were no complainants with the fish counts. First there was Alpine and then North Star. (Nuiqsut) (MBC AES 2004)

Maybe [the change in quality] is related to the ice road. Maybe it's blocking wintering fish feeding grounds, blocking the freedom of movement for wintering fish; they are blocked from the ice road near Spy Island [a barrier island east of the Colville delta; Most [of the ice road] is grounded. (Nuiqsut) (ABR Inc. et al. 2007)

My theory is that late in the season, with the building of ice bridges, migration routes are being blocked. With ice bridges being built across rivers, it naturally forms ice underneath. By the time the ice road was done in April we found about 70 feet of ice formed beneath the bridges and only about five feet of open water left at the bottom for the fish to pass. That practically covers the whole river and prevents any wildlife or fish to pass the river at these areas where ice bridges have been built. I would like a study to be done to determine if these bridges are being grounded to the ground. I feel that the bridges affect the fish greatly as well as the community. Industry says no, we need the oil here, but further studies need to be done to do it right. (Nuiqsut) (MBC AES 2004)

Titaaliq, the burbot, just about every year I go ice fishing. Last year I caught one and it was yellow where it was supposed to be white. A few other times the liver was discolored and I am wondering if that is coming from Umiat or all that stuff they buried at Pivoqsook and all the erosion from the banks. (Nuiqsut active harvester; Experience timeline: 1992 and ongoing; Experience location: Tuigauraq. SRB&A Interview 2007). (SRB&A 2009)

Dredging affects the turbidity of the water and in turn affects the Arctic cisco and their migration patterns. (Nuiqsut) (MBC AES 2004)

There are little fish that are good for qaaktaq that discharge out of the Colville River– ice bridges are blocking them in. (Nuiqsut) (ABR Inc. et al. 2007)

Our fish used to be a lot bigger. We have gone from 3-inch mesh net to 2.5 inch. One year they said the low catch in the Nigliq was because of the slush. After the first year of the crossing [HDD drilling under the river], there was a lot of drilling mud that was lost. Scientists and biologists believe that this mud has not affected or harmed the fish because the mud contains a lot of salt. Some people are skeptical; they feel that this didn't help the fish at all. (Nuiqsut) (MBC AES 2004)

We're already a living example of if you would eat contaminated animals or fish. Right now, our burbot is contaminated with PCP from the contaminants in Umiat. And we're - I'd say like 60 percent of the village used to harvest burbot. Now I'd say only 10 percent if even any 10 percent. (Nuiqsut) (MMS 2001b)

There are lots of fish within the area. The plant sucks in the yearling fish and also changes the salinity of the water within the area. The place where the most cisco are found is where Old Nuiqsut, currently Helmericks fishery, was located. Causeways could block the fish from traveling between the Mackenzie and Colville Rivers. (Nuiqsut) (MBC AES 2004)

They are extracting gravel from Napaung Lake. This will affect the Broadhead and Whitefish. The lake is very long. When they pump these lakes it takes away the food source of the fish. At Oliktok, there is a large salt water intake. How big is the screen? Is it small enough that it doesn't suck in the food source for qaaktaq and other marine animals? (Nuiqsut active harvester. SRB&A Interview 2007). (SRB&A 2009)

The changes are the burbot, that eat the fish. The burbot are more slimy in their skin, and the liver has changed; the taste of the liver has changed, the burbot liver. I don't know, maybe after that one big mud [discharge], when they drill and also when they are near Umiat, and there's a lot of debris in the Umiat area. We found out now that burbot, after they found out that they had PCP in the livers. The elders that have been eating those have died from cancer. (Nuiqsut) (SRB&A 2013c)

Before development began the abundance of fish was higher and the fish were fatter. Since the development started there has been a low recruitment of fish and they have become skinnier over the years. (Nuiqsut) (MBC AES 2004)

There was a decrease of Arctic cisco in Colville after a few years of the HDD drilling. Since it is up and operating and drilling has stopped, it seems like the Arctic cisco run is getting better. Now the fish counts seem to be getting better, perhaps because there is less industry activity, less underwater drilling. (Nuiqsut) (MBC AES 2004)

We don't know how much, the ones that affect the areas where the fish travel on these rivers and the activities that are going on in the Colville [River] are the ones that really affect our area. Last spring we didn't get hardly any fish over at Chandler and Shainin Lake. Like the alpine development; that's really affecting us. Do fish migrate? The activities on the Colville River, those that drain in there, that affects us. (Anaktuvuk Pass) (SRB&A Unpublished)

Not on a regular basis. A major oil company here on the North Slope was fined heavily for illegally dumping at Endicott, which is on the migration route of the Arctic cisco to the Colville. I feel that illegal dumping is a serious problem, whereas five kids playing in a swimming hole is probably not the problem that has wiped out the cisco. (Nuiqsut) (MBC AES 2004)

There was a decrease of Arctic cisco in Colville after a few years of the HDD drilling. Since it is up and operating and drilling has stopped, it seems like the Arctic cisco run is getting better. Now the fish counts seem to be getting better, perhaps because there is less industry activity, less underwater drilling. (Nuiqsut) (MBC AES 2004)

3.3.5 **Birds**

Black brant, you can catch those up here [directly east of Barrow], and if you want to harvest large [amounts] you can go [here] [Wainwright area]. Black brant are not my favorite type of geese, but if I'm in the area and I can harvest them, I harvest them. When I go eider duck hunting over here [in the lagoon], the black brants sometimes fly back and forth where the eider ducks fly south. The black brants fly back and forth between feeding grounds. (Utqiagvik) (SRB&A 2010a)

That's pretty much it except for on the spit, there's lots of eiders along the whole lagoon spit, lots of eiders. The whole thing; I've seen eider nests throughout the whole spit from here to Icy Cape. They don't nest too far apart, from here to the wall and there'll be a whole pod of them. (Point Lay) (SRB&A 2011a)

All those birds I tell you about, they go all along the coast. After they're born, first two weeks they stay around there, then we see big bunches of babies floating around the lagoon. Inside the lagoon. Hundreds and hundreds of birds. They raise them in the lagoon. All the way up to Icy Cape we always see babies bunched up. (Point Lay) (SRB&A 2011a)

Eider ducks, geese, swans, loons, and there's aahaaliqs [long tailed ducks], what you call it in English? Always see them raising their young all over the lagoon. They call them isas. (Point Lay) (SRB&A 2011a)

[The brants are] mainly inside the lagoon going south. We're always seeing them in the lagoon. They go from point to point (in the spring). They hit the points like this and fly this way and head over. But when there's open water they seem to fly over the open water a lot. (Point Lay) (SRB&A 2011a)

All along the coast, the whole spit is key habitat for the birds nesting, all over. Up Kukpowruk River, in all the lake areas [there are], loons, terns, everything, swans, cranes. I have never seen a crane egg but a swan egg. I saw a nest that was abandoned and they never came back. (Point Lay) (SRB&A 2014b)

There's an island at Kukpowruk. That's called Snow Goose Island, The big one. That's where there's a lot of snow goose end of June. Elders used to tell us where to go for that [egg harvesting]. If you want to get snow goose eggs, don't get too much. Plus [they nest] right from the village. I think it's this one [lake] here [near Point Lay]; it's got to be this one. That's where the Canadian geese go. There'll be hundreds of them end of June. Canadian geese. They're nesting there. Swampy area around that area, it must be their food. (Point Lay) (SRB&A 2011a)

There's some birds that don't normally come this far north, but they do nowadays. The weather warming up, they have more areas where they could raise their chicks and produce, reproduce. (Point Lay) (Braem et al. 2017)

Also at the mouth of Niglingaurat black brant used to nest there by the hundreds. There were so many that they looked like bowls from a distance filled with eggs. We could have hunted them if we chose to. When they flew away, it looked like there was a big, black cloud. But we do not hunt them. (Nuiqsut) (BLM 1998c)

When the thin ice near the mouth of the river breaks up, that is when they start duck hunting. We, the residents of Nuiqsut go there to hunt for ducks when they arrive. I do not know how the ducks that nest along the sea coast are doing because it has been so long since we lived there before we moved back to Nuiqsut. There is a very big nesting area along the sea coast though but since we moved here some time ago, we do not know whether it is still that way. (Nuiqsut) (BLM 1998c)

Back in, when I was beginning to be a boy, my parents, they owned a canoe. So we have to go down the coast when the, when they, after all the ice caved. We had to haul some driftwood for when, winter use, along the coastline. There used to be some, these stellar eiders just bunched up in one spot, another bunch, another bunch, in the summer months, after they nesting in the, in the, up inland. They stayed along this coastline in a big bunch, you know, in bunches, bunch, bunch. But for the last years that I have known, have seen my, personally, I haven't seen any flock along this shoreline for the last few years. I don't know what, what became of those ducks. Kenneth Toovak (Utqiagvik) (MMS 1982)

Birds, migratory birds nest quite a bit around the delta...Also, quite a bit of goslings and nestingers (ph) from Iysuk (ph) by Cape Halkett along the Harrison Bay to Fish Creek near the Ocean on those swampy areas. (Nuiqsut) (BLM 1998c)

I'm not sure about what kind of studies were done on the National Petroleum Reserve or how many studies or how far those studies went because it is warming up here in the Arctic and we're kind of warming up at a rapid rate up here and you know we're starting to see new species of bugs, new species of birds traveling this way. (Point Lay) (BLM 2019b)

They're all over that flat [spit]. [There are] all kinds of eggs, even seagull eggs. The birds lay right in the flat area there. Eider ducks, seagull, aaqhaaliq [long-tailed duck], Arctic tern, geese, and all them birds, they always lay eggs right there. Always in June, they lay eggs. (Point Lay) (SRB&A 2014b)

Right here [mouth of Kukpowruk River] is where they feed, I guess, or rest. Probably both resting or feeding, last year me and my uncle saw maybe 1500 take off at once. They were all bunched up all in this area. When you look up to the sky you could see nothing but ducks. (Point Lay) (SRB&A 2014b)

Phalarope. There used to be millions. You don't hardly see them any more. The whole shoreline used to be covered every time in the fall. And you don't see them inland where they nest. (Utqiagvik) (MMS 1982)

Same way with these, these little birds, snipes. Used to be in the fall, along the beach, just hundreds of it, along the beach, you know, in the ocean. But same, same thing. They're gone. Maybe you'll see one or two there, this and there, but not hundreds anymore. (Utqiagvik) (MMS 1982)

I think [when] the weather changes, animals come early like the geese. We were trying to go by the calendar by how we used to hunt them and by the time we get there they have already gone north. (Anaktuvuk Pass) (SRB&A Unpublished)

That is where they all nest, all the way over here and on the channels. They go in the wetlands. We could see all of the nests over there, just hundreds of them. That's where all of the eiders and King Eiders and the Brants nest (by Oliktok Point)... (Nuiqsut) (SRB&A 2012)

There are different waterfowl that are coming up here; they cannot be named because they are new to the region. The sand hill cranes used to be much larger and there are stories that they killed people. We have them up here I have shot them before. I didn't know what to do with them when I shot them. The one mate started circling me and it kept going up and up and it disappeared... I buried the other sandhill crane. Some of these birds must have been huge to where they could kill people. (Nuiqsut) (SRB&A 2012)

Ravens too, they were gone for a while and now they are starting to pop up again. I saw a swan in October. We saw a lone swan after freeze up. It must have been lost, it looked weak. Someone maybe shot the mate because if that happens then they die too. (Nuiqsut) (SRB&A 2012)

3.3.5.1 Teshekpuk Lake Special Area

In addition, this is also Carroll's testimony, in addition the entire area around Teshekpuk Lake is an extremely important habitat for waterfowl nesting, molting, and feeding should be excluded from leasing, exploration, and development there for that reason. (Utqiaġvik) (BLM 2019a)

In addition to the area north of, this is the last page of Carroll's transcript, in the area of the lake it is extremely important for habitat of molting black _____ (01:30:35.85) and then Nesting White Footed Geese and the construction of a pipeline could be very detrimental on these populations. (Utqiaġvik) (BLM 2019a)

The area to the north and east of Teshekpuk Lake is vitally important for many molting geese. Up to 20 percent of the entire Pacific flyway population of black brant can molt in the Teshekpuk area at any one time. This is a great concern that molting birds are susceptible to disturbance and any activity in these areas has a potential to greatly reduce the population of brants and other geese. Also in the area there are relatively dense populations of king eiders which are very important again for subsistence and king eider populations have declined by about 50 percent in the last 20, 25 years. There are also many other species of waterfowl that are important in this area and we need to learn a great deal about them. (Utqiaġvik) (BLM 2003a)

3.3.5.2 Effects of Development on Birds

I'll go get your oil from your part up here and then when you look at this area up here this is the nesting ground of the migratory birds of this planet. This is where they go nest. We saw what happened to the Snow Geese in Prudhoe Bay. They were chased into Canada and once they got there they overpopulated. Now their nesting ground in Canada is destroyed. Where the Snow Geese going to plan for home now? And we're going to do that to all the other animals? Let's get our Secretary to do the work right and first take care of our private property we need and then two to look at our climate, how we're living in it. It's not important to go after oil and gas when you can save all the species that migrate and when you go to the ocean it gets scarier yet. (Utqiaġvik) (BLM 2019a)

I do have a few other wildlife issues and concerns and these mostly have to do with birds. The first is oilfield activity or the development of oilfields on the North Slope has most likely increased -- well certainly has increased some predator populations and has mostly likely led to the increase of other predator populations. And the predators I'm speaking of are foxes, ravens, and gulls. Part of the issue is garbage and that garbage has allowed -- has provided additional food sources for these predators. There's another issue that's out there, though, too, and that concerns mostly ravens, but foxes as well, and that's -- there are places where ravens can now build nests or foxes can den or take their young. And so those are some of the reasons that the predator populations have increased as well. The result of those increased predator populations has been a decrease in the productivity of many birds that nest within the oilfields and many of those birds are important for subsistence. (Utqiaġvik) (BLM 2003a)

These wildlife folk that see it—they've witnessed, I guess they are wildlife folks, that walk in the country and [are] looking at birds and things in the Colville River Delta, maybe the east side, down by Ulumniak (ph), that's next to—not far from the old Nuiqsut site, they're monitoring these birds and go to and from these places with a chopper—upsets, disrupts, displaces—perhaps some of [our] only opportunity to go get...game, especially caribou, in the area are scared and may...run off because of these impediments that arrive [and] are not natural. Naturally, [we] would walk along the coast where they're at and be able to harvest...caribou. (Ruth Nukapigak, as cited in USDOI, BLM, 1998, NE NPR-A Scoping, Nuiqsut) (MMS 2007a)

I have gone how many times to Inigok where there was some drilling that took place, and I have seen bones from birds that have been killed from the, from after they drill a hole, the stuff they leave behind, the fluids. I don't want to see that kind of thing happening where we see our wildlife and waterfowl dying from contaminants being left after having conducted drilling activity, I don't want to see that kind of thing. And leaving an area without having done some kind of thing to put it back into the shape it was before the drilling took place. (Atqasuk) (SRB&A 2003)

Now, let's look at what's going to happen after you discover the oil: you're going to have to lay roads, you're going to have to lay gathering systems, you're going to have to lay buildings, you're going to have to lay pipelines. And when you start laying pipelines, then you start harassing animals like spectacled eiders, steller eiders, snow geese, the peregrine falcon, those kind of animals are going to be bothered. When I, as a person, shoot one of those animals I can get fined up to \$10,000 and put in jail up to five years. What does the industry get when they damage those animals? What do they get? Nothing. You might give them maybe a \$10,000 fine, but heck, that's the price of developing, it's very affordable. But me, that live here, I go to jail...And when you start your development and you endanger those animals that are endangered -- that are on the threatened or endangered species list, when I do it I become a criminal. What are you when you allow it to be done? What is BLM? What is the State of Alaska? When they allow these threatened animals to be endangered you are a criminal too. And it becomes premeditated because you plan it ahead of time. (Utqiagvik) (BLM 2004c)

3.3.6 Terrestrial Mammals

See traditional knowledge provided in the ACOUSTIC ENVIRONMENT and WATER RESOURCES sections for traditional knowledge that is also applicable to this section.

3.3.6.1 Caribou

Teshekpuk Lake Habitat

With all these possibilities we are likely to have ample oil revenues in the future. This greatly reduces the motivation to restore and develop the crucial wildlife habitat areas such as Teshekpuk Lake and the Western Arctic Special Area and the Colville River Special Area. We should continue to protect these areas. They are very important to wildlife and subsistence hunting. End of Carroll's transcript. (Nuiqsut) (BLM 2019e)

You also ask our opinions for areas where there should not be pipelines. Again, the area around Teshekpuk Lakes should be avoided, one of the worst places for a pipeline would be just north of the land. A pipeline running east and west would interfere with the ability for the caribou to travel towards the coast or encourage _____+ (01:29:51.86). It would also impact caribou moving south away from the insect relief area grazing areas where weather conditions are favorable and insect harassment is reduced. This would have a negative nutritional effect especially in the years that conditions cause the trail to the insect relief areas and that back and forth multiple times. Every age _____ (01:30:16.45) through the herd uses that area so it would affect the entire herd. (Nuiqsut) (BLM 2019e).

Please take notice that Teshekpuk Lake is the core habitat of what we subsist on. This area supports the caribou, fish and waterfowl habitats. If this area is disturbed, you have no idea what detrimental effects it will have on our resources in the long run. (Utqiagvik) (BLM 2004c)

And our caribou always go down to that Teshekpuk Lake or for the -- they always come through in springtime to go down north to that Teshekpuk Lake. And then after they have their calves in the fall time they -- if somebody don't scare them off on their way coming this way, they usually come back in the fall right through our village and that's how we have our food gathered up for winter. (Anaktuvuk Pass) (BLM 1998b)

We need to be very careful there because this planning area is starting to get over into the calving area of the Teshekpuk Herd. There are very -- there are narrow migration corridors over in that area that the herd needs to move through and it's an important insect relief area. Insect relief areas are very important to a herd because during the summer when the bugs are driving them crazy, they need to be able to get

out and get relief from the bugs and they also need to be able to get into feeding areas. So, you know, as work progresses in that direction, we need to be extremely careful not to hinder the movement of the caribou to their calving areas and their insect relief areas. (Utqiaġvik) (BLM 2003a)

The west side [of the proposed area of development] is getting over into the Kogru River area in the area that was originally excluded from leasing because it's extremely important for waterfowl, nesting, and molting, and it's also very important as a caribou calving area. This, of course, is getting over into the Teshekpuk region and our Teshekpuk Caribou Herd, which is the most important subsistence caribou herd for most of the villages on North Slope. For the villages of Barrow, Nuiqsut, Atqasak, Wainwright, this is the herd that we hunt and this is the one that we're very much dependent upon. (Utqiaġvik) (BLM 2003a)

The caribou migration and the Teshekpuk herd is the most important component of our wildlife here on the North Slope. They don't migrate as much so -- as essential caribou herd does, or porcupine over to the east. Teshekpuk caribou herds is always on the North Slope, they don't go no further than the foothills in the Brooks Range. (Nuiqsut) (BLM 2004d)

Nearly all of the parturient cows move north through the narrow corridor between Teshekpuk Lake and the Kogru River. It would be very difficult to have any development in this corridor without the risk of seriously affecting the population. However, this corridor is part of the area that BLM has proposed to open to leasing and development. (Utqiaġvik) (BLM 2004c)

The Teshekpuk Lake herd uses the planning area for calving, like the gentleman just explained to you, feeding, insect relief, and 19 percent of the time, for over wintering. (Utqiaġvik) (BLM 2003d)

Even the caribou know that their calves have a better chance of surviving if they can just get to the narrow corridor to the east of [Teshekpuk] Lake. The Teshekpuk caribou herd somehow gets enough sustenance from this area to winter in the North Slope, unlike other Arctic caribou herds that head south. It is from this herd that the Inupiat who live here get the majority of their year's supply of tuttu meat. (Utqiaġvik) (BLM 2004c)

The area to the southeast, the east and northeast of the lake, Teshekpuk Lake, which is critical caribou calving area. There are probably ten to fifteen thousand caribou that calve in that area each year. And also to the north of the lake, that entire area from the Beaufort Sea coast to along the northern edge of the lake and on over to the Ikpiġuk River area are all fairly crucial insect relief areas. The movements of this caribou herd during much of the year are somewhat erratic and unpredictable during the fall and the winter they go to many places, but what is predictable about this herd is that most of them show up in that area east of the lake and pass through that area between the Kogru River and Teshekpuk Lake every year, that's pretty consistent in that most of the herd will be seen north of the lake in the summer, usually up to twenty-six to twenty-seven thousand caribou can be counted in that area. It's pretty hard to imagine that any development could occur in some of these critical areas without being detrimental to that caribou here and incidentally this is the herd that most of the villages on the north slope harvest. It's the primary herd for harvest in Nuiqsut, in Barrow and Atqasuk, and many years it is in Wainwright. It's kind of split in Wainwright between the Western Arctic herd and the Teshekpuk herd. The Teshekpuk herd is smaller than some of the other herds but probably more important on a subsistence basis to the people of the North Slope. (Utqiaġvik) (BLM 1997a)

There used to be thousands of caribou in that area in the 70s. [For the] first time we see a little bit of herd this summer come from the east, because the migrations of the caribou has changed a lot. The Porcupine Herd comes from the east, that's along the coast, and the Teshekpuk Herd comes from the west; that's the western herd. The migration of the western herd has diverted southward. We used to see them coming in from the coastline, but now we see them coming from the south. Mainly [because of] too much traffic. Bow hunters and head hunters. I think they don't usually wait for the first herd to come by and then the second herd gets diverted. (Nuiqsut) (SRB&A 2015)

Other Important Caribou Habitat

Another place where there should be no leasing is the Western Arctic Herd special area in the southwest part of the NPRA. The area contains the calving area. For the Western Arctic Caribou Herd there are several important migration corridors. The trauma and activity in that area would be detrimental for the herd. The Western Arctic Herd is an extremely important subsistence resource for some North Slope villages and many villages in the northwest part of the state. (Utqiagvik) (BLM 2019a)

That [caribou calving] would be in Kukpowruk area; in October when we are fishing they are all over, that is where they are calving, that whole area. They usually are there every October. For some reason they didn't make it there this year. (Point Lay) (SRB&A 2014b)

We get [one] herd coming from the south and [another] herd coming in from the north. We get the best of both of them. They're calving, giving birth. This whole area right here [south of Wainwright] because of all the vegetation. (Point Lay) (SRB&A 2014b)

They seem to be coming down behind Wainwright, and back behind us toward the mountains. When you see them along the coast, it's smaller groups of them. October, mainly. Sometimes they're right in our yard. They winter here. (Point Lay) (SRB&A 2014b)

We don't go south in July because all the caribous are out here [indicating an area from Anajuk Point northeastward to Qulvi], all the way, all the coast. ... It's cool over here. We start feeling the ocean breeze around [Anajuk Point]. When we turn, right when we turn, you know, there's the breeze, ... and that's where the caribous are, from right here [at Anajuk Point], you know, all along—where they should be. (Nuiqsut) (HDR Alaska 2015)

Other Caribou Observations

It's unusual to see our caribou in the dead of winter; they're mostly south at this time of year. The weather trends [are affecting the caribou]. (Nuiqsut) (SRB&A 2015)

Looking at your Alternatives A, B, C, and D, it's a --it's a real coin and the toss issue for me with our caribous being in that location right in October. Maybe there's global warming taking effect from past ten years up here. We used to get caribou migration during September. Last year I think they came in December. And we're in October, and there is no caribou migration. I -- I like Alternative A and also D, but I would also benefit from C -- B and C. With exploration being up there, it would be able to misplace the caribou herd, possibly changing those herd, sending them south -- southward bound toward Anaktuvuk. That's where we would also benefit. It -- it's exploration versus subsistence. That's the type of my -- my thinking that I've been thinking. All these alternatives are good. I've -- I really want to benefit. Maybe I'll -- I'll leave it up to the caribou herds. If there was full-scale exploration to move those herds southward, that's where we would benefit. If there is a lot of structures in that area, maybe we'll benefit year round up here. (Anaktuvuk Pass) (BLM 2007)

We're seeing the changes. The caribou have problems. Lesions on the liver with a bad cover. They have lesions on the joints and internal organs. We asked the North Slope Borough about testing, but they said they have no budget for that. Where do we turn to identify the problems? (Nuiqsut) (BLM 2003b)

When the caribou was in short supply we would travel to Tasiqpak knowing that we would find caribou and to the area close to Kuuguluk. Before we moved back to Nuiqsut I used to also do my hunting at Umiat. That area is a prime hunting ground... (Nuiqsut) (BLM 1998c)

Back in 80s and 90s... [caribou] used to go right up to village and turn that way and some of them would pass that creek we always go through, and some would pass that and go to Itkillik River and go back out, and not anymore. The closest caribou I ever caught was two and half miles [from the village]. (Nuiqsut) (SRB&A 2014a)

Normally they come through this oil field right around here and I have been doing a lot of hunting on this side and we haven't seen much caribou over here. Half of the caribou we catch are sick. Green, yellow. They have big pus bubbles the size of my fist. (Nuiqsut) (SRB&A 2012)

Yeah, it's different now, the migration. I know that years back it used to be end of June, July. Now I think it's later than July and the herds are smaller. There's smaller herds down there. I think because of the pipeline over here. They say it's not affecting [the caribou], but it is. They're coming later and later. If you get an aerial thing [picture], you can pretty much see the footprints of the caribou, coming east-west like [local elder] was saying. Since they made the other pipeline going from the river crossing, it has changed, too. (Nuiqsut) (SRB&A 2010a)

Porcupine Herd that comes to Kuparuk, they changed from there and some of these in Central and Teshekpuk are slightly changed in timing, July most of them are on the coastline. There were times in July that all the caribou were on the coastline until August-September. (Nuiqsut) (SRB&A 2010b)

I guess the caribou are more skittish nowadays. People are approaching them and they are gone. Before they used to just hang out and you could drive by them with the boat and they would just look at you. Now when they hear that outboard motor they are gone. They are more skittish nowadays. Maybe it is that aircraft activity. There is a lot of traffic out in that area. (Nuiqsut) (SRB&A 2014a)

This year we didn't get no caribou. What would BLM do that would help our community that was impacted by no caribou at all? No migration because of that infrastructure that are being built north of our community, and the activities that are going on no north of our community. And for 50 years we had—or more than 50 years we had depend on caribou. And every time we get no caribou, we don't get no disaster funding. We get help from Wainwright people. We get help from Barrow people, from Nuiqsut people. [unclear] 13-15 caribous at a time. But that's not BLM helping us. It's our own entity that's helping us. We're being impacted, but like the community that we are depending on caribou all our lives. What kind of impact funds that we have BLM would do for our community when this happens to our community in every year. To those sport hunters, activities going on up North and all that infrastructures that are being built. What kind of impact funds that would—anybody that would help our community. We tell you guys over and over we've been impacted for years. We never get any disaster funding. We get help from the other villages. Last year we got to help from Kenai. They sent us some fish. I really appreciate Kenai for helping us. They understood us. But for years, we told you guys over and over who are these people that are affecting us? We don't get any disaster funds. We don't get any help from BLM. Nobody except from North Slope Borough or the communities of Wainwright, the community of Nuiqsut, or the community of Barrow. If there was some kind impact fund, what would this kind of situation be reported? Because we're telling you, over and over, about our situation about the caribou. (Anaktuvuk Pass) (BLM 2018a)

Caribou is still important right now. From years and years from when I was a little boy [caribou has been important]. Guide hunters, well, they push the first caribou and [the caribou] turn around and go someplace else. And we wait and wait and wait [for the caribou]. [Traditionally] we wait until they pass the village, three miles down and then we start shooting them. They [the ones that pass] don't care, they [other caribou] just come by. (Anaktuvuk Pass) (SRB&A Unpublished)

In springtime we hunt the caribou in April, May. [They come] from the south. Sometimes [in] October [the caribou come] from the north. (Anaktuvuk Pass) (SRB&A Unpublished)

TAPs has a lot of negative impacts because the Dalton Highway is open to the public. Our caribou, the Central and Porcupine herds, go through the Sag. River and they are diverted by bow hunters. These folks have access to it, they can come across the right-of-way but they are not allowed to walk along the road because that is private property. I have run into so many people looking for wounded caribou which they have shot and are looking for caribou. A lot of impacts from TAPs are happening today. Any of these still, if only ADF&G could put seasonal [restrictions] on these bow hunters then our caribou would be able to come across the Sag River and move westward. We do not see 1000s of caribous coming this way anymore. There have been a lot of impacts and what kind of programs have they done to us? Nothing,

none. Even though we are impacted these programs were not given to the community. That is what I have seen and experienced. (Nuiqsut) (SRB&A 2012)

Caribou Calving Sensitivity to Disturbances

The challenge is to decide where to draw the lines between where petroleum exploration and development occur and where wildlife and subsistence values are protected. In the past planning processes, we have come up with compromises where leases were available for much of the NPRA but the critical wildlife habitat areas were protected. You asked us to outline areas that should not be opened to leasing, exploration, and development. Teshekpuk Lake continues to be one of the most biological productive areas in the circle polar arctic that should be protected. The area just south of the lake is extremely important for caribou calving of the Teshekpuk Lake Herd. The area north of the lake is critical for insect relief. The areas east and west of the lake have narrow gaps of land that are important migration corridors. Most of the cows and calves migrate through this narrow gap between the lakes and _____ (Cogro? 01:27:10:42) Inlet to the east and cows and calves are particularly sensitive to roads and cows and calves are particularly sensitive to roads and industrial activity at the time of calving. (Utqiagvik) (BLM 2019a)

The pipeline should not run within forty miles of the south side of the lake because of the caribou calving area. They should not be run through the narrow gap of land between the east side of the lake _____ (Cogro? 01:31:03.11) Inlet because it's a very restrictive and important caribou migration area for cows and youth calves to travel to get insect relief. Cows with calves are very sensitive to structures and activity and would be detrimentally affected by construction of the existence of the pipeline to that area. There should also be no pipelines running through the calving and insect relief areas of the Western Arctic Herd. There should no pipelines running along any of the major rivers because of the danger of a spill destroying a major subsistence fishery. Even pipes running across the main _____ (01:31:42.07) could result in major damage to a fishery. Pipes should not be run in areas where there are a lot of subsistence camps where people commonly come because it would lower the volume of those people's lives. (Utqiagvik) (BLM 2019a)

The females have effects during calving. They're under a lot of stress. They lose a lot of little ones. (Wainwright) (SRB&A 2009)

...there is a narrow corridor of land between the east side of Teshekpuk Lake and the Kogru River, which nearly all of the parturient cows must travel through shortly before or after calving to get to insect relief areas. Cows with calves are very sensitive to disturbance, so we have the most important segment of the population passing through this corridor during the time of year when they are having calves and are most sensitive to disturbance. Development in this corridor and the calving area south of there could have a detrimental effect on the herd. (Utqiagvik) (BLM 2004c)

Very important that the calving area right by Teshekpuk Lake there should be no allowed for oil drilling and disturbing the caribou herd there. Also caribou migrate route from that area through Anaktuvuk roads, Chandalar Lake area. During the fall migration, there shouldn't be no activities. Also spring migration from south, if they start going down to the -- towards north, there should be no activities in the way of travel north and south. (Anaktuvuk Pass) (BLM 2007)

It is very important for pregnant cows to get to and use the calving area, which is south, east, and north of Teshekpuk Lake. Over ninety percent of pregnant cows calve in this traditional calving area. During years when cows can't get back to the calving area, calving success has been much lower than years when most of the cows did get back. (Utqiagvik) (BLM 2004c)

Effects of Development on Caribou

And I notice that game appears thicker along the pipeline corridor than it does in other areas and I believe that the phenomenon that the Mayor spoke to earlier about the pipeline deflecting the game is, in fact, a

converse. I believe it is an attractant, it's luring, if you will, game away from areas which may have traditionally been used by subsistence hunters. So I think the effect that people are experiencing, a decrease, perhaps in game density is real but the effect that they are scribing to it is as a deflection is, in fact, incorrect, it's actually an attractant. And I attribute this to two phenomenon. I'm not a scientist, I'm an economist by training but I do observe these game patterns on an annual basis. First of all, the dust from the Dalton Highway spreads out and settles on the snow and then when the sun returns, that's the first areas that become snow free so the game then, rather than having to paw through the snow, the caribou especially and the ptarmigan, are attracted to this corridor and then the predators follow suit. So the best place, if you want to observe game is actually up and down the Dalton Corridor, especially in the spring. The second phenomena that I attribute this attractant phenomena to is the fact that it's something of a hunting sanctuary, you know, there's the 10 mile Dalton Highway Corridor which is limited to bow hunting only and the entire area around Prudhoe Bay is closed. And it doesn't take game long to figure where they're not persecuted. And as I think as you experience in other areas where there's a game refuge, that's where all the game is especially on opening day of hunting season. I think the caribou have figured out rather quickly that they're safer from hunting along the corridor and then the Prudhoe area and so tend to collect there. Mark Helmericks. (Utqiagvik) (BLM 2002)

It will be about 12 to 15 that we average in that area. It was less than that. Too much air traffic. That is the main problem, is that during summer there is too much air traffic. The caribou is unable to come near this area. Conoco has an interest in this area too [Fish Creek.]. (Nuiqsut) (SRB&A 2010b)

Fish Creek towards Tingmeachsiovik [River], before they put the bridge on, [there] used to be caribous around there. They used to hang around there, but I don't know. Now [because of] that bridge they don't go over there. Used to be some, lots of caribou out that way [by] Atigaru [Point]. And [now] hardly any caribous. They used to go look for caribous around there. (Nuiqsut) (SRB&A 2015)

Only thing I could say is they're confused, because they get to this area where they usually go and they can't go there. They're trying to find any way to get to the west side. This one was about, I'd say more than a thousand, but one went a few miles and crossed. [They're] lost. Migration where they've been going has changed. Where they're used to going they can't go anymore. They have the pipeline by CD3 they have to go farther. Same way with the pipeline that goes the other way. I'm surprised that they even go past that. Some will go. Ever since they put that up they only go through there the west side. (Nuiqsut) (SRB&A 2015)

Ever since the pipeline came in from Alpine to 2L, the caribou migration's been different. When I came in in '93, we caught 12 caribou in by Nanuq, and since then I've never seen them come through that area. Since the pipeline came in, they don't go through the village any more. We caught like 12 bulls, and we never seen caribou in there again. And that's definitely an impact. (Nuiqsut) (SRB&A 2014a)

The pipeline, wish they could change it to make it more dull. They [the caribou] think it's ice, so they think they need to stop and go back from where they come from. Summer time I can see it from my house. Pipeline and helicopters [are] probably the two main distractions for caribou in this area. That pipeline needs to go. (Nuiqsut) (SRB&A 2014a)

The pipeline keeps them from crossing. Not like they were crossing [before], because the Western [Herd] and Porcupine [Herd], they normally come this way, but last two years they've been on Point Thomson side, Prudhoe side. I haven't seen a Porcupine herd in how many years? (Nuiqsut) (SRB&A 2014a)

[For the] first time we see a little bit of herd this summer come from the east, because the migrations of the caribou has changed a lot. The Porcupine Herd comes from the east, that's along the coast, and the Teshekpuk Herd comes from the west; that's the western herd. The migration of the western herd has diverted southward. We used to see them coming in from the coastline, but now we see them coming from the south. Mainly [because of] too much traffic. (Nuiqsut) (SRB&A 2015)

Fumes: When the caribou smell exhaust fumes, without even looking they will go. When they smell man or combustion, the noise, they go up straight inland. That's why you don't let them smell you when you're

hunting. You have to get upwind. I think there are a lot of caribou around Prudhoe. When I worked there I noticed that somehow the smell doesn't bother them. But around here they're bothered. (Barrow active harvester; Experience timeline: since 1950 and ongoing; Experience location: Barrow area. SRB&A Interview 2007) (SRB&A 2009)

I've heard from other hunters complaining about caribou looking sick. I caught a couple maybe two or three years ago. It's possible. I think the caribou are getting sick because of the flares they are burning over at Alpine. You see this dirty air. And we have north winds a lot of the time when they burn that yellow smoke and it gets deposited on the tundra. That's why I think the caribou are getting sick. (Nuiqsut active harvester; Experience timeline: 2004; Experience location: Just up the river. SRB&A Interview 2007) (SRB&A 2009)

The caribou on the west side of the village, some are okay on the ocean side but the ones closer, the one I got was a sick [one.] I decided to not even bother to hunt [that type of] caribou because they're loners, and the loners are the ones who hang around [the developed areas]...they're protecting themselves from the bears and wolves and they're using the pipeline as coverage. They can get close to the Alpine or the village, and the wolves won't. They have peace away from the other carnivores. They're picking up air quality damages or something. For us, when we ingest something wrong, we get heartburn or hiccups. I think they do that to, they get the same thing but it stays in them like cigarettes. (Nuiqsut) (SRB&A 2011b)

Just the flares that are always going. I kind of think that's why they are getting sick. Flares are on 24/7, and I think that mercury is making them sick. The [pollutants are in the] air and drops down to the ground, and [gets on] the food that the caribou eat. (Nuiqsut) (SRB&A 2014a)

There's always caribous on this side of Itkillik and not too far from Itkillik-Pa.... I go up inland. There's always caribou there in August. Plus, there's always helicopter flying, doing their survey, and I don't get caribou just for, you know, the helicopter [to come] bother me. There was [a] helicopter doing their survey [over] Itkillik-Pa and on this side of Ocean Point. There's always caribous [there], but there's always helicopters disturbing [them]. That was in August. (Nuiqsut) (SRB&A 2014a)

In the beginning you were mentioning that the Secretary of the Interior had the authority over this NPRA, how it works. What's so hard about the Secretary of the Interior settling the ownership of the land inside the NRPA? What is holding him from doing that? And when you're looking at making roads and pipelines and wealth like that you know the structure of the North Slope. You have a calving area at Teshekpuk Lake. The caribou after they are born ____ (01:08:07.41), swing by Nuiqsut and head up toward Anaktuvik. Then after Anaktuvik they all head out west. This is their natural migratory path and we also know that when you lay a pipe in front of their path the caribou no longer uses that path. Knowing this you would endanger the ability of ____ (01:08:33.81), Nuiqsut, and Anaktuvik and probably up into Wainwright of the migration of one herd. We watched what the other herds have done over further east, east of Prudhoe Bay and in Prudhoe Bay. They don't follow their migratory paths anymore. We should have learned something from this but I don't know what's going on there when it comes to the learning part. The caribou will not cross a pipe, with have a pipeline right there or a gas line going to the east field over fifty, sixty years. The caribou still don't like to cross that piece of pipe right there. It's alive to them and it scares them and then we start laying pipelines all over the North Slope. The caribou is going to be the first animal to go. (Utqiagvik) (BLM 2019a)

In those things we recognize some of the hurdles and we also recognize the current state of infrastructure on the Slope from North Star, from ENI ____ (01:33:57.79) Development to the Hooper Development using unstable areas on the North Slope that are um free from permafrost issues that's why they call it thaw stable areas and the pipelines that are buried in these areas are um part of the future dialog in the technical report of how change in dynamics of local climate change issues and, and other areas that BLM needs to consider about thaw stable areas along rivers being the Trans Alaska Pipeline, if you go down the highway there's about a forty mile section of that pipeline that's buried in the thaw stable section of the ____ (Sauanatak? 01:34:58.76) River on the Snake River in that, in that river corridor where it's thaw stable. Those are some of the things that have not been highlighted and they are important features

of development not just because they are out of sight and out of mind, because of the more important needs of the free movement of terrestrial animals. (Utqiagvik) (BLM 2019a)

[My] biggest concern is the caribou migration, if the oil exploration would bring a pipeline. The migration passes through Wainwright almost every year. I've lived here since 1991. I get my yearly supply of caribou in September and October. I've heard from people in Nuiqsut: once Alpine came in the caribou migration was affected. (Wainwright) (SRB&A 2009)

There used to be a lot more caribou, but it's getting to be a lot less going to that area. Because they're getting diverted in Meltwater. The pipelines from Meltwater to Kuparuk are so low and they can't cross the pipeline. (SRB&A Nuiqsut Interview March 2009) (SRB&A 2010b)

Well, the pipeline is a problem. When you look at it, it is reflective. All that pipeline that comes to Alpine and goes to Kuparuk, it shines and it looks like ice out there. The caribou look at that and they are re-routed. If you come here in the summer time, and look, it looks like a glaring ice pack out there. And we told Conoco Phillips that the caribous that are coming from the east side and the west side, they need to do something about the pipeline. It goes all the way from Colville all the way to Kuparuk and where are the caribous? Some of them do migrate all the way through there. And once they see that pipeline, the caribous think that they are close to the ocean [that's why they reroute]. But on this side [west side] you don't have that yet. (Nuiqsut) (SRB&A 2010b)

He knows that Teshekpuk has never changed much, they still go on the migration of their past. Central Herd is same general area, but changed slightly, because low water happened and some pipeline in Meltwater. Can't come across it, and that's why it's up, caribou can't cross to the other side. They go around the pipeline. Some of them [pipelines] are real low. Make sure they are seven feet [tall]. The older ones are those ones deflecting the caribou [new pipes are better, taller]. (Nuiqsut) (SRB&A 2010b)

I never seen a real lot of caribou. Back then we used to have a lot. There'd be a lot more caribou in this area than compared to the west, Teshekpuk Herd. When they'd migrate there'd be more. In the 50s there's lots of caribou used to cross right down there, in the summer time. Never do that anymore, hardly. They start CD3 and Alpine, but that Tamayayak River used to have lots and lots of caribou but hardly any more. CD3, the people told Alpine, there's hardly any here. There used to be a lot of caribou that migrate right here, they don't do that anymore [by the coast]. (Nuiqsut) (SRB&A 2010b)

The Porcupine Herd that comes from Canada through here, when the pipeline, when it went all the way to the Meltwater, when they build that pipeline to Alpine, they stopped seeing them. Oliktok, to Meltwater. (Nuiqsut) (SRB&A 2010b)

They start to come in late, they used to come in early, now they start to come in late. Right now, there's nothing there and Teshekpuk stay around there most of the time. We can't get any caribou around here, there's the pipeline and Kuparuk [even if the caribou were there]. This is the caribou area. Nowadays they gonna get the caribou [south]. (Nuiqsut) (SRB&A 2010b)

One of the main caribou crossings on the Colville River delta. And then what I had never realized what Sara Koonalin (ph) had said was that during the migrations and when it's very hot in the summertime, the caribous like to go along the high banks of the rivers to stay cool when they're in mass amounts. And then I just wanted to point out, and then keep in mind that, you know, that we have to take care of our caribou and stuff like that, and then just wanted to point out that it hasn't been pointed out in a long time, when the caribou start migrating in low areas where there's swamp and stuff and they like to get on high banks when it's really hot and then that they like to travel through there to try to cool off from the Arctic breeze and stuff. And that's the only thing that I was against, is that pipeline structure is a little too low and I'd like to see it like 10 or 12 feet high because most of our winds are from the east to the west and then, you know, they make -- with that pipeline there, they make an unnatural barrier for the caribous to cross. (Nuiqsut) (BLM 2003b)

In the NPR-A Northwest draft, it says that there will be 150 flights a year. Well, Alpine, the model of a smaller footprint, had 1900 flights from Alpine in the summer of 2001. How was it expected we would not be impacted in a significant way with the subsistence harvest study that showed our village harvested there? They claim that the caribou herd is healthy with numbers, but the only caribou I got last year was bad. Twenty caribou were harvested in October when we could access areas not accessible by boat. Seventeen were sick. When I went camping last year, I waited three days for the herd, to have a helicopter to divert them away from us. When they were diverted, we went without. We have had to deal with harassment. We had overflights three times while trying to cut the harvest. It is disturbing. The next year we had a helicopter do the same thing, but it was worse. They were carrying a sling going from Alpine to Meltwater, another oilfield. It went right over us three times. The herd was right there and it put us at risk. I had my two young sons with me and it made me very angry. What am I to do when the activities that have been handed down for thousands of years to our people are being changed by the global need for energy? (Nuiqsut) (BLM 2003b)

The caribou haven't been coming about the last few years. There seems to be a border of where the caribou want to go. I don't know if they have realized that [they don't want to go to those areas] due to past activity. It has become like that ever since they started seismic explorations, probably five to 10 years. The seismic activity has been moving further west, all over. Every time we go to Umiat we experience exploration. They [oil industry] have been moving further and further west, and the caribou have been moving further and further west. Looks like a mini-town when you see it from a distance. You would find exploration activities but it would be further east, closer to Colville. The next year, it is further west, and that's where you find the end of the caribou. This year, where they last did seismic exploration, that's where you find the caribou. It seems like they've learned the exploration boundary, it seems like they're not crossing them [the boundaries] anymore. (Utqiagvik) (SRB&A 2013c)

It varies whether we have a lot of activities going on. When there are a lot of activities going on, we hardly see any or they [caribou] change their migration route. Oil and gas, airplanes, helicopters, bird survey people—airplane, floatplanes. Either there are less caribou or they are changing migration with activities. I don't know which. (S.R. Braund and Assocs., 2003, Field Interviews, USDOI, BLM, 2004) (Nuiqsut) (MMS 2007a)

...I feel because of all the traffic between Fairbanks and Endicott, much more increased traffic, that caribou are hesitant to cross the main roads because of all the traffic. I feel that has something to do with the caribou migration as well, because of increased [air] traffic...not just ground, as well as...seismic operations happening all over. (Lampe, 1997, NE NPR-A Scoping, Nuiqsut, USDOI, BLM, 1998) (MMS 2007a)

We will have the same problem we did in the Prudhoe Bay and the Kuparuk area with our caribou. Right now I call our caribou that are existing around here that don't go nowhere our 'industrial dope addict caribou.' They already sick and nobody's doing anything about them. (USDOI, BLM, 2004) (Nuiqsut) (MMS 2007a)

Caribou displacement. You've heard of the Meltwater and Alpine. The caribou are displaced where they used to go to eat. Instead of caribou, we have vertical supports. If you put up a pipeline, you displace the wildlife. Before Alpine we'd see caribou every summer, every year. They came in the thousands every year. After the pipeline, we don't see them like we used to. We used to catch a lot of caribou from the Porcupine Herd. Not any more. (Nuiqsut active harvester; Experience timeline: 2002 and ongoing; Experience location: Nuiqsut. SRB&A Interview 2007) (SRB&A 2009)

The migration of the Eastern Herd that comes through the Colville River has really changed since Alpine with all the pipelines. It's deflected the Teshekpuk Herd from the east and south; because of the pipeline changing their migration route. (Nuiqsut active harvester; Experience timeline: Since 1977 and ongoing; Experience location: Colville River. SRB&A Interview 2007) (SRB&A 2009)

Before they started the [helicopter] activity, the caribou were in the area by the thousands. Now they migrate out and none come in. It is harder to find caribou every year. I grew up hunting caribou from Wainwright. Barrow used to be like Wainwright. The caribou are starting to winter further south. When you reach Wainwright they are everywhere. They are all around Pt Lay. You would always meet the caribou just before October, they were always here. They don't come up from the south anymore. They changed their migration route. From Wainwright they start heading to Barrow but at Peard Bay they turn around and head south. (Barrow active harvester; Experience timeline: since 1996 and ongoing; Experience Location: Alaktak. SRB&A Interview 2007) (SRB&A 2009)

Maybe it's over the last five to six years the caribou routes have dramatically changed since the oil and seismic going on. Like this summer, there were hardly any big herds coming through. You have to go way up for subsistence hunting. You have to go further and further. There were a lot of complaints this summer. All the helicopters flying around. Maybe they're chasing them away. (Atqasuk active harvester; Experience timeline: 2001 and ongoing; Experience location: We go way up. Sometimes 7-12 miles from our cabin. Sometimes we go out by Skull Cliffs. SRB&A Interview 2007) (SRB&A 2009)

Nothing has been done. They say caribou can go under [pipelines], but sometimes they turn back. We mention that to oil companies, to bury the pipeline half a mile away from the coast so caribou can get away from mosquitoes. They say they can go under, but I don't see them go under. Especially along the coast, crossing Sagavanirktok River, then they could go along the coast. (Nuiqsut active harvester. SRB&A Interview 2007) (SRB&A 2009)

Here in Nuiqsut I hardly get any caribou due to the pipeline diverting the caribou. I used to see five to six thousand caribou. I haven't seen a herd like that in years. It's like a rolling thunder when you see that many of them. But they're real sensitive. I don't see that here any more because of the pipeline. (Nuiqsut active harvester; Experience timeline: since 2000 and ongoing; Experience location: Nuiqsut. SRB&A Interview 2007) (SRB&A 2009)

Because of the pipeline and the choppers and aircrafts that were flying around. When we were way down by the Chandler area and there was air traffic going on over here at Umiat and that red and white plane of Alpine kept following the river and scaring the caribou like he is doing it on purpose. We have bright clothes on and he knew we were there and he made a couple passes and made the caribou run further inland. That was wrong. Red and white plane. We had the caribou in our sight and plane comes and it took off and turned back around and did the same thing and same path and that [made us angry]. (SRB&A Nuiqsut Interview March 2009) (SRB&A 2010b)

You know, what I think about it, since they built that pipeline up, the Porcupine Herd doesn't want to come this way. I think that pipeline is diverting them. Because the Porcupine Herd that's coming in from the east usually travels along the shores. I think they come in from the shore and stay in this area around Beechey Point, because there's no way to go further westward. (SRB&A Nuiqsut Interview March 2009) (SRB&A 2010b)

Mostly the caribou used to come from the west, back in the old days before that Alpine there was nothing around, we had caribou coming this way and that way. They mostly came right [through], the whole section of this from the eastern [direction]. Back in the old days, before that activity. Alpine, it started happening since they build that pipeline. Some [caribou] go further north coming in. Especially when they build that pipeline, they really divert that caribou that used to come straight across before Alpine was here. The pipeline's just right over here. All that pipeline goes there and the Western Herd, before the pipeline, they used to go straight there. They really divert that caribou. All those caribou used to come from the eastern herd and go right through. (SRB&A Nuiqsut Interview March 2009) (SRB&A 2010b)

There used to be a lot more caribou, but it's getting to be a lot less going to that area. Because they're getting diverted in Meltwater. The pipelines from Meltwater to Kuparuk are so low and they can't cross the pipeline. (SRB&A Nuiqsut Interview March 2009) (SRB&A 2010b)

That's where most of the Porcupine Herd usually comes, around here, due to that pad; that pipeline that goes from Alpine to Prudhoe has pretty much changed the route of the caribou migration. The only big herd that usually came around is the Teshekpuk Herd; they came around. None of the Porcupine Herd that usually comes around, they never really came around, [because of] that big pipeline and the pads that connect to Alpine. And that other pipeline that goes all the way to Kuparuk. And from the north pad, CD3, down to Alpine. And then it goes to Kuparuk. It's shiny and makes the caribou not want to go through. Those caribou are scared of the pipeline. Some stick around. Some go towards it and go back. (SRB&A Nuiqsut Interview March 2009) (SRB&A 2010b)

It's mostly the pipeline that is affecting the caribou pattern. In the 70s when we first came, there would be 10,000 in a herd but now, due to the pipeline, it affects the people here and they have to go 30 miles out in all directions to hunt for caribou. It's too shiny. The coating is too shiny. More likely...when we were riding on the ice roads one time, we could see quite a few caribou crossing but maybe in the summertime, due to the reflection of the sun, they don't want to cross. They'll pass right under the pipeline [in the winter]. (SRB&A Nuiqsut Interview May 2010) (SRB&A 2010b)

Also the pipeline is so reflective that sometimes the caribou thinks that is the edge of the ocean, the ice pack, so that is why they go and travel further south of us. Those pipelines are still shiny, it's not coated. All the way from Alpine, pretty much from CD north, all the way to Alpine, it's so shiny; all the way it looks white. And it's reflecting. We always address that with them, and they say they might change that but they didn't. That always [is] a problem with their representative that comes to our meetings. (SRB&A Nuiqsut Interview May 2010) (SRB&A 2010b)

When a caribou is going to run for safety, they jump six to seven feet and they have their racks on so they have to be able to get underneath the pipeline if they're going to cross freely...when it's running away if the pipeline's too low with its racks it could be running and hit the pipeline and then sheer off its horns and it could cause it permanent or lethal damage to itself. (Anaktuvuk Pass) (BLM 2003c)

And just last week when I was cruising through Prudhoe Bay area like from where the bridge crosses Miluveach and where you start hitting these orange drill sites, pads, and stuff and it just hit my mind that your infrastructure of your pipeline is so low that at times that while you're cruising from that area past that bridge all the way past KOC of Kuparuk that your pipeline is so low that even a caribou wouldn't even attempt to try go over or under, neither. And then your caribou crossing things are so far distance when you look at it, I think I only see three of them. And then on top of that, I just want to point out that the infrastructure like that are for where the pipeline is also they're like permanent unnatural snow fences where the caribou crossings and stuff are, and then that's one of the things that on the environmental side that you all have to be looking out and be aware. And then I really disagree of this five feet pipeline -- five feet high of the structure that you guys are proposing around our land and our area where the caribou migrations and stuff are. (Nuiqsut) (BLM 2003b)

Infrastructure: Atqasuk. When we travel we see roads and I'm pretty sure it makes the caribou go away from our village and closer to Atqasuk. We noticed when we went to get our new snow machine from Barrow. (Wainwright active harvester; Experience timeline: ongoing; Experience location: Barrow to Atqasuk to Wainwright. SRB&A Interview 2007) (SRB&A 2009)

Seems like they're sticking over by the pad, that one. They mainly stay around this area, don't move nowadays. I know that they spend a lot of time over by Alpine. They don't move once they get by over there. I guess just like at Prudhoe Bay. You even see herds go under the building, to cool off.. Because it's cool, there's a draft going under that building. I used to work in Prudhoe Bay for how many years, a technician, for their annual tests to see if there's anything leaching from their pads. (SRB&A Nuiqsut Interview March 2009) (SRB&A 2010b)

That CD 5 and 6, that's going to divert my caribou farther south. [During] some winters there's too much air traffic and hardly any caribous come from the west. It's not like back in the old days before the Alpine was there, before the air traffic was there. Yeah, we were camping out and the activities, the caribous

used to come over here [from Teshukpuk towards Nuiqsut] They never could come over this year. Mostly with choppers, and airplanes, and the flights to Alpine, that really affects the noise problem. [It affects me] when I'm up there in the summer. [And the] regular plane to Alpine. (SRB&A Nuiqsut Interview April 2010) (SRB&A 2010b)

The caribou migration has been changed rapidly because of the road or too many traffic (sic). Mostly the caribou with the collar don't have enough fat and the meat always taste different. I think if they took the collar off from the caribou I would be satisfied or if I see one I'll kill and leave the collar right there because I won't eat it, too skinny. The problem we got, they put too many collars. And some cows that come through here this fall, I saw two cows with a collar, I think they don't have fat. They were -- probably had more worms than my dog had worms because of the collar. And besides it hurt the skin. You can see when it moves around right here, it rubs the fur. Gilbert Lincoln. (Utqiagvik) (BLM 1998a)

And another thing is, the pipelines, they need to be-- they need to have crossways for the caribou because the caribou I think will just follow the pipeline if they don't want to go under. I think that would be very important if they start development around that area. The caribou have to have a place to get down to the ocean in the summertime for --from the -- get away from the mosquitos. I've watched -- as a hunter, I've watched caribou when they're migrating. I've watched them cross my snowmachine trail, they don't have any problem with that. But if I walk across their trail, the caribou will immediately turn back, just from the scent of my feet. I've noticed that, I've watched that as -- just from being a hunter. I think the -- it will really impact my hunting; if the caribou move away from that area, I have to go somewhere else. So I would think that the caribou have to be taken care of, that's my main concern. (Utqiagvik) (BLM 2004f)

Pipelines; we have seen caribou turn back from pipelines because they [caribou] see a flash from the pipeline. They used to go to Helmericks' in the thousands, not any more. Maybe two or three or less. Especially females with young used to go down there. Westside at Kugaruk, Harrison Bay, there are caribou there. You always see them. We had to go out to the ocean and to Kugaruk to catch them. (Wainwright active harvester; Experience timeline:1999 and is ongoing; Experience location: around Alpine, Meltwater and Nuiqsut. SRB&A Interview 2007) (SRB&A 2009)

There is so much activity going on it drives the caribou away from the insect relief areas. This makes them keep running, wearing off fat, not lying down. They want to do seismic testing there in the insect relief areas. This is one of my biggest concerns. (Barrow active harvester; Experience timeline: 2006 and ongoing; Experience location: The southern boundary of the North Slope; the mountain side, central and western parts. SRB&A Interview 2007). (SRB&A 2009)

We're getting to go further and further to catch caribou. Because their route has changed. They're not in our backyard. Now I have to go to other communities' backyards, like Anaktuvuk, Atqasuk and Barrow. Caribou you have to go out further because of seismic testing, helicopters, small aircraft. They'll be flying those choppers again. They'll be doing it soon when they gather information like when the ice goes out or when they haul their contractors out. This scares the caribou. What happens when the belt breaks on your snow machine? I walked 10 hours home once. (Nuiqsut active harvester; Experience timeline: since 2001 and ongoing; Experience location: Nuiqsut. SRB&A Interview 2007) (SRB&A 2009)

I've noticed that since they started making ice roads, the caribou are hardly out there anymore. The caribou are 30 to 40 miles out. Some people told me they go 60 miles out. That's the Village of Atqasuk. I called them once to see when there were caribou. (Barrow active harvester. SRB&A Interview 2007) (SRB&A 2009)

It's longer [until the caribou arrive], we have to wait for the caribou to cross the river. Sometimes they don't even cross the river. Yeah, ever since Alpine started, we are having to wait for caribou to cross the river. It seems like they're sticking over by the pad, that one. They mainly stay around this area, don't move nowadays. (SRB&A Nuiqsut Interview March 2009). (SRB&A 2010b)

If I'm able to hunt within 1,000 feet of the pipeline, then it isn't an issue. But a lot of areas between here and Deadhorse, the pipeline is just too low. The snow builds up and they aren't going to put their head

down to go under. I saw a caribou blocked just the other day, by Deadhorse. One side of the pipeline is all bare, and the other side is all open land. (SRB&A Nuiqsut Interview March 2009). (SRB&A 2010b)

The caribou that we see at Fish Creek are so far away from the channels, and it's not that easy to harvest caribou and wait for the caribou. And sometimes we have to travel farther west. But a lot of us who go there, we have to wait and a lot of the caribou are diverted by the aircraft. They [aircraft] are counting fish and some caribous that have collars on them. (SRB&A Nuiqsut Interview March 2009). (SRB&A 2010b)

It is hard to say, you see helicopters flying around, you have things going out there that are not usually there, human activity. It is hard to say, with the Meltwater road. With the last couple years the caribou haven't been coming like they used to. I usually catch 20, 30 caribou for my mom and other people. [I have been harvesting] way less than usual. (SRB&A Nuiqsut Interview April 2009). (SRB&A 2010b)

The Prudhoe Bay spine road is like a gate: the caribou get corralled in the area by roads, traffic, pipeline reflections, and staging. They get confused. They are scared to cross the pipelines, they are as scary as a grizzly bear would be to the animals. Some caribou are driven south, others are driven to the coast. If more roads are built, then there will be more blockage of the caribou. They will get stuck in the oil fields like a corral. The ones stuck south stay south and get little insect relief, while those going north get to the beach and the coast and get relief (S.R. Braund and Assocs., 2003, Field Interviews, USDOI, BLM, 2004). (Nuiqsut) (MMS 2007a)

I think the pipeline in a big factor in the caribou migration being disturbed. Because when I first came to Nuiqsut in 1993, we would be at Nanuq downriver and the caribou would come straight across – Fish Creek, hundreds of caribou – and then the pipeline came and.... And that year – 1993 – I got 10 fat bulls in July. We got a whole bunch of caribou right about where they put that pipeline. After the pipeline the caribou don't go through there anymore. They either go, their route changed, go through Fish Creek and come this way. The pipeline definitely changed their route. (Nuiqsut) (SRB&A 2015)

Pipeline height is always an issue. Five feet minimum is inadequate. I mean you hear so much. You hear that it's a concern to the community. And the coating of the pipe, the outside layer, you know, it's just like a reflection especially during the summer hot months. I mean you could see that, you know, the pipe having reflection. I think they should put better, you know, coating or something that wouldn't reflect. I think that's where the problem -- maybe -- I don't know. Maybe that's one of the issues that needs to be addressed, that it's deferring the caribou. I mean there's some studies, I think, that needs to be done. (Nuiqsut) (BLM 2003b)

The pipelines, you know, maybe the caribous don't like to go through the pipeline even if they can go through, they hardly don't do that anymore; they always have to go around somewhere. They always start to go up river and then up around Fish Creek. We can see tracks down by Ocean Point and then going up towards Fish Creek [circle around south and then back north toward Fish Creek]. There used to be big herds going through there almost every year. We would have lots of caribou in my area [before], they go by my house; bunch of caribou would be hanging around in that area and go over towards Fish Creek. Those pipelines, some of them are not too high, and some of them there are places for them to go through alright, but they always be scared or something, I don't know. (SRB&A Nuiqsut Interview May 2010) (SRB&A 2010b)

With the five foot proposed pipeline height, it's a big concern to me. As you are aware of the studies that were done on this was for caribou during the summertimes and, as we all know, it snows during the winter and the snow drifts and builds up. It's a different case during the wintertime where caribou may have problems crossing pipeline during the winter months. So I would recommend a minimum height of seven foot instead of the five foot minimum. (Utqiagvik) (BLM 2003a)

In addition to this 13-mile pipeline I'm talking about, with the new discoveries that already occurred south of the Kuparuk field, we have about another over 10-mile pipeline again, that that's three feet high. And then you look at the caribous when they - when they're trying to get to the ocean side, they're always

migrating, keeping away from these bugs and everything. They stop right at Oliktok. They - we don't see those anymore, these thousands of migrating caribous. Now, at the same time, we're seeing hundreds. (Utqiagvik) (MMS 2001a)

Look at Nuiqsut. Couple years ago they were finally able to catch caribou around their town because -- three years ago there was seismic being done around Teshekpuk Lake, and what they did was take that herd around Teshekpuk that used to come here to Barrow to feed us, they chased it all the way over to Nuiqsut. And that winter we caught nothing here. We had -- our hunters had to go above Atqasuk, above Wainwright to find caribous for themselves. You are talking traveling from 60 to 100 miles just to find something to feed your family. Did we get any assistance from anybody? Heck, no. And the federal government couldn't lease it fast enough. (Utqiagvik) (MMS 2009a)

Seems like they're sticking over by the pad, that one. They mainly stay around this area, don't move nowadays. I know that they spend a lot of time over by Alpine. They don't move once they get by over there. I guess just like at Prudhoe Bay. You even see herds go under the building, to cool off. Because it's cool, there's a draft going under that building. I used to work in Prudhoe Bay for how many years, a technician, for their annual tests to see if there's anything leaching from their pads. (Nuiqsut) (SRB&A 2010b)

Actually, with the Meltwater road on there, the caribou are getting lost. They don't know where the migration route is. We've got the Prudhoe roads over there, but the Meltwater comes farther down, and in the caribou's mind, where's the direction? We used to have the caribou coming into town, the migratory route [used to] come in, but now they don't do that anymore. (Nuiqsut) (SRB&A 2013b)

That migration pattern has gone southward. We hardly see the western herd this year. The Porcupine Herd, haven't seen them lately. We used to see thousands of Porcupine Herd coming through the villages, but we haven't seen those for a number of years and since that pipeline was built, that changed the pattern of the migration of the caribou. [We are] mostly harvesting caribou from Western or Central Herd. (Nuiqsut) (SRB&A 2014a)

Pipelines; we have seen caribou turn back from pipelines because they [caribou] see a flash from the pipeline. They used to go to Helmericks' in the thousands, not any more. Maybe two or three or less. Especially females with young used to go down there. Westside at Kugaruk, Harrison Bay, there are caribou there. You always see them. We had to go out to the ocean and to Kugaruk to catch them. (Wainwright) (SRB&A 2009)

I don't think that has changed much, except we used to get the Porcupine Herd, but no more. After the pipeline, we don't see them anymore. (Anaktuvuk Pass) (SRB&A Unpublished)

There has been some adjustment time for the caribou from the Alaska pipeline, the oil pipeline. And I think they have adapted to that pipeline now. So this project might not have as much affect because it's along the one that's there. The road to Umiat will definitely affect the route of the migration, but that's another study. (Anaktuvuk Pass) (SRB&A Unpublished)

Any activity that goes from north to south, [the elders] made the statement, north to south activity is not too harmful. It's not affecting the migration of the caribou that go north and south. They travel north and south, so that north to south activity doesn't have much of an effect on the migration of the caribou. So that's not a concern, and it's already going through completed project before. (Anaktuvuk Pass) (SRB&A Unpublished)

We live on caribou. I don't know what they changed, the haul road or who knows what now. [after road and pipeline we are] hardly catching caribou [in the] fall time. The [proposed road to Ambler], that's gonna make it worse. Cause that'd be in the winter [that it would be used for construction]. DOT [will] make an ice road, snow road. (Anaktuvuk Pass) (SRB&A Unpublished)

Maybe on the seismic – it's always the most distracting, because there's a lot of wires, and you are crossing [over] wires. When they do the seismic, the caribou seem farther out. Even in wintertime, when we see lots of seismic activities going on. You could see it right there, just laying on the ground in the land area. They're bright orange and you can see them for miles and miles. (Nuiqsut) (SRB&A 2015)

Pretty much the caribou herd, what they always talk about. The migration route is a big concern to all of that. As long as I have been here we used to get the caribou herd run through town. When I was little. IT's been about 10-15 years or something. Since they actually came through town. They actually come into town, the caribou trails. You can see them come into town. And then there is a couple more, and on top of that hill around here, that hill has a caribou trail that has always been there and everything. (Nuiqsut) (SRB&A 2012)

Nigliq seems a little wider. The caribou don't really go. They used to go further into the pipeline and now they split into little groups. I remember when there used to be thousands. (Nuiqsut) (SRB&A 2012)

One of the concerns I have, I was about 13 years old when the porcupine caribou came through town. I don't see tutu come through town anymore. There are trails that are old caribou trails, they used to run strait through town but that was before Alpine. They go around now and stay away from the community. (Nuiqsut) (SRB&A 2012)

Yea, they will divert the migrations when they are in the middle of their construction because they will not stop for caribou pass by. The caribou were already affected by the TAPs. When those drill sites expanded that is when the caribou were diverted. They were diverted eastwards instead of going through the village. The development is going to be a concern to the wildlife. It will actually be more difficult to go further to harvest caribou. If they open that Umiat road what will happen to Anaktuvuk Pass and Nuiqsut? They will cut off our access to the Central and Porcupine caribou herd. That is going to be an issue when they build this. How are the wildlife, and the caribou, be address under that APP project? (Nuiqsut) (SRB&A 2012)

Undoubtedly for good the animals need a sanctuary. I have always joked and said that since I have worked the oil field for several years. Before that the closest I could get to a caribou was maybe 500 yards, but in the oil field you can get a whole heck of a lot closer. They know it is safe. (Nuiqsut) (SRB&A 2012)

3.3.6.2 Moose

The wolves are a major impact on the moose population. There has been industrial activity that takes place there more recently. I don't know if that's affecting the moose or not. You theorize activities there in winter time, it's so cold there, that any additional movement or pushing of the animals has an impact on their ability to survive the winter. They're using their fat reserves. Additional activity is going to burn that off quicker. One year they found a couple animals off the Umiat runway, they had pneumonia, a cow and a calf. If you run animals hard in the winter time you can frost their lungs. This is just my opinion, but the wolves probably pushed them hard enough to where that happened. (Utqiagvik) (SRB&A 2013c)

And some people always run into moose that are – they say that some moose have a big lump on the side of their bodies and they don't really know what are causing the bumps in that area. We have learned back in the 1980s that there was a lot of seepage of battery acid from the Umiat site.... Maybe from the battery acid from that Umiat site. (Nuiqsut) (SRB&A 2013c)

There's two places that I know where there's always a lot of moose. Right by our camp [at Sentinel Hill] on the east side mainly, the majority of them. One year we saw maybe five to six calves in there. Two cows had calves. Then by the Uluksrak [Bluff]. The high country is on the west side, so we could go up there and then scan the area from the west side and look at the east side [for moose]. (Nuiqsut) (SRB&A 2013c)

Basically on the Colville, between Anaktuvuk Pass and 20 miles up from Umiat is where you find the most concentration. They usually tend to gather around Umiat area, in about a 10 mile radius of Umiat, but

basically on the river. That's where you find the bulk of the moose herd. It's always been like that due to probably the highest concentration of willows in that area. (Utqiaġvik) (SRB&A 2013c)

Well, the first time they declined there were high incidence of brucellosis and leptospirosis. We thought that contributed to the decline. This time we're testing them, they don't seem to have their disease. They're dying of pneumonia, which is usually secondary to other diseases. We're in the midst of doing range studies there. The population isn't really high, but we're finding moose that starve to death. We sampled the willows and there was plenty of browse. Now we're sampling the quality. They're way up on the ragged edge of where moose ought to be. Maybe the plants don't pick up nutrients the moose need. And, to keep things more complicated, the snowshoe hares just moved into the area in the early '90s, before it didn't have rabbits. Just as the hares came in, the moose population fell. One thing that can happen with willows is if they're being preyed upon heavily, they'll start producing toxins that make them less digestible. (Utqiaġvik) (SRB&A 2013c)

3.3.6.3 Small Mammals

It should also be known that leasing in the Colville River Special Area, this oasis is a riparian habitat is very productive and supports wildlife populations such as moose, hares, lynx, that are not abundant on the rest of the North Slope. It's an important area were North Slope people can harvest meat and fur trapping, conduct fur trapping. (Nuiqsut) (BLM 2019e).

They're basically in the Umiat area, that's where you tend to see the most concentration of rabbits is Umiat area. Probably about same as moose, where the willows are the thickest. Up the Chandler and up the Anaktuvuk River, but more in the main river. I think they're about ready to crash. I don't know how many year cycle they have, but it's getting close. (Utqiaġvik) (SRB&A 2013c)

Trapping was abundant east of here. Now, we don't go over because of the oil field. Just recently, it is known that the foxes are very dirty, discolored and rabid in that area. Trapping is done elsewhere. We used to see grizzly bears around. Now, they are not around. Where's the caribou now? One summer when we used to walk miles looking for caribou, we came across two dead caribou for unknown reasons. The animals have faced a change. We have faced a change since activity began. If there is to be further activity, the fish and the sea mammals will suffer and we will suffer too. We depend on the fish, wildlife and the birds, still, today. Bessie Ericklok. (Nuiqsut) (MMS 1979b)

You don't see lynx anymore, at least up there. There were hardly any to begin with but my grandpa would get them all the time. I don't know why they aren't really around anymore. You just don't see them. (Nuiqsut) (SRB&A 2012)

Also there have been porcupines this far north. Camp robbers [birds] or chickadees are up here until January. (Nuiqsut) (SRB&A 2012)

3.3.7 Marine Mammals

3.3.7.1 Distribution of Marine Mammals in Nearshore Environment

Seals

When the river floods, near the mouth of Nigliq river it becomes filled with a hole or thin spot in sea ice that has melted as the river breaks up. When it reaches the sea that is the time that they begin to hunt for seals, through that thin spot in the sea ice that has melted. They hunt for bearded seals and other types of seals. (Nuiqsut) (BLM 1998c)

About a quarter mile off here, the brown water and the green water off of the shore. Off of the coast. [It looks] like there's already a line right there [on the map]. That color, that brown water and green. And then at the end of June those seals kind of eat on the outside of the brown water for some reason. I don't know why but maybe it's that muddy taste. I'd rather wait until the lagoon clears up and then start getting

fish. Dirty water – the fish don't taste that good. They (seals) are on the green side of the water. (Point Lay) (SRB&A 2011a)

I know the ugruk season was kind of slow because the river water was kind of murky and as soon as it cleared up, they started showing up. I just got one. I think I was the only one that harvested one in June, and then the ice went out all of a sudden. It is every year [that the water is murky] and you don't see them until it clears up. You only have like a two week window for hunting ugruks and seals. (Point Lay) (SRB&A 2013a)

Utukok Pass. They go feed there for herring I think. That is a special place, there is like 50, 60 [seals] around there. I have never really seen them on the passes south of Five-Mile [Kukpowruk Pass]; I see them on Five-Mile Pass, Eleven-Mile [Akunik] Pass, Utukok Pass. The pups stay in the pass. All along the spit the pups are down there. There is quite a few of them. (Point Lay) (SRB&A 2014b)

Hardly any [bearded seals]. It seems like if we're not catching them, something's happening. I used to see lots of bearded seals on the ice but this year, like I said, I saw a pod of 100 seals on the ice but this year I didn't see that number. I saw like half of that number, maybe 30 when it should have been 100. I almost want to say this is my theory, because of our climate changing and the ice getting rotten farther, the seals have more of a chance of swimming away from the areas. When they have good ice these animals can't swim away. They have to stay in the area and keep that ice open. They have the freedom to go anywhere now. There's more rotten ice. (Point Lay) (SRB&A 2013a)

Well, the seals have been coming onshore onto the land more frequently than previous years. I think it's because of our ice. It hasn't been there. Same thing with the walrus too. They've been onshore here for almost a month now. I think they go out and feed and then come back to shore because there's no ice for them. Yeah, I guess our northern ice cap has been melting so all the ice that does form over the winter is mostly first year ice which melts over the summer. That's been the case here the last few years with our walrus and seals. They come to shore here near town because there's no ice for them to rest on. (Point Lay) (SRB&A 2013a)

It's earlier than usual. First of June we get that breakup, end of May. That was the weirdest point of the season. It goes right away, it don't stay anymore. We used to get that ice first two weeks of July but end of June is when the ice is going out. We used to hunt bearded seals. Nowadays we're lucky [to harvest a bearded seal]. Lot of animals like to stay up where the ice is. (Point Lay) (SRB&A 2011a)

Walrus

Point Lay seems to be a good habitat for walrus, lately! It's typical, but we've been seeing big haul-outs. We're seeing 1,000 [count] haul-outs. Right out here on the first point I was talking about. It seems to me like they've been hauling out right there for the last three or four years in the thousands. I see like 800 or more. Uh-huh, there's lots of haul-outs all the way to Icy Cape right now, a hundred, fifty, but for some reason they want to stop right here. Icy Cape would be another big group of haul-outs. They gather up there, right on the point. (Point Lay) (SRB&A 2011a)

We live on the mainland, but we have Kasegaluk Lagoon, which is an 80-mile stretch of lagoon that goes from the foothills down south about 30 miles from our village all the way up to near Wainwright, which is considered the longest lagoon in the world. And there are 11 inlets. And every year we have birds migrating from down south coming up and utilize that lagoon. The walrus use that lagoon to get out of storms that happen in the ocean because I've witnessed it quite a few times during my 40 years. The belugas go in there and, you know, as well as, you know, ducks, geese. We have a wide variety of waterfowl that utilize that lagoon. (Utqiagvik) (BOEM and BSEE 2013)

Walrus are hauling out more and more in the fall. The ice is changing. During the fall time the ice is way too far for the walrus. They go haul out on the shore. They picked our barrier islands to do that. About the first of September, they start doing that. That's when the Fish and Wildlife do the walrus tagging with the crossbow. They say there's a lot of clams out there. They wanted one of us hunters to get one, just to

see what they're eating. And they are full of clams. Sometimes there's a few... this one year they found 30 dead walrus out there that just beached and died with a lot of sores on their face and bodies. But these last two years, I never saw anything like that yet. (Point Lay) (Wolfe 2013)

That, you got it right there. Yeah, we do sometimes occasionally go past Cape Sabine. This is where we get the walrus over here.... Walrus, you'll see them here and there [adding a small use area to the existing one], maybe just a mile from shore. (Point Lay) (SRB&A 2011a)

Polar Bear

Now we see they use the islands and banks a lot more now. Even when ice floes are big enough to use, it is the time of the year when there is a lot of snow during November, December, and that is when we see a lot of snow come around. Even if the snow is not dropping, it is drifting. That snow is drifting into areas where they have to put a den. You could see hardly any snow in one area when you go outside, but snow has accumulated enough for use. We see a lot of that happening now. By March they know where to go when they come out of their dens. (SRB&A Utqiagvik Workshop, January 2018) (Braund et al. 2018)

He indicates there are more bears starting to den using the land. Some bears are denning in low, flat areas where snow can build over time in that area. They are starting to look for other places to den other than mostly the ice. (SRB&A Wainwright Workshop, January 2018) (Braund et al. 2018)

When the young ice that we call siguliaq is older, young ice that has gotten thick over time, and it starts to ridge and it gets long and go for quite a ways. A lot of ringed and bearded seals look for that kind of condition so they can live in there year round. There is enough snow for a lair, so they do not have to move away so much. The bears are looking for that type of ice to hunt in. The puktaagruaq are large multi-year or large chunks of ridged up ice. Icebergs. Puktaaq. Single large piece of heavy ice. Bears like that area too. They like to be on the thin stuff too. Siguliaq [thin ice]. (SRB&A Wainwright Workshop, January 2018) (Braund et al. 2018)

Generally, bears start coming from the east when the lagoons are freezing. In September and October they come from north with ice then they get on the ice with the beach. In the winter time, with the west wind, they come onto the shore fast ice. In the spring time, they know where to go; they know it is whaling season and know they will have food to eat. You see that pattern with almost all of the whaling villages; they know how to learn when it is time to go whaling and go to those places. The seals are moving too with the seasonal migration happening and belugas and walrus with the floating ice. The timing is important for animals migrating and with those migrations are going to be the predators (SRB&A Utqiagvik Workshop, January 2018) (Braund et al. 2018)

When a polar bear is really hungry it does not matter how big or small it is. When there is that factor the bear will not stop. There is that source of seal skins, rendered oil or food in the community. It has been like that for many, many generations that he has seen and these communities know that when an animal is starving when he smell something, he will not stop at a gun or person or dog. He will be determined to get that source of food. (SRB&A Wainwright Workshop, January 2018) (Braund et al. 2018)

Participant 1: You have to scare them so they will not come back; not just shoo them away. You scare them. Gun shots and shoot near them on the ice if not going to take them. It reduces them coming back.

Participant 2: Chase them out with snowmachine. I think we need to chase them farther rather than just a little bit out of town so they will not come back.

Participant 3: When they first come around, you shoo them away, but they go out and you think they not going to come back. When they do come back, the bear hunter will chase the bear out until it knows [Name] that it is not welcome in the town. Chase him really hard. Chase him until the point they are tired, and that will reduce that bears chance of coming back. It knows it will get tired. That has been taught to whalers and community members. That sort of action. It is in our bear patrol. We try to teach the same kind of tactics that were used through generations. We put that part in our bear deterrent program.

Participant 1: Cracker shells and bean bags.

Participant 3: Hard chasing been around a long, long time. (SRB&A Wainwright Workshop, January 2018) (Braund et al. 2018)

I would like to mention our polar bear as well. I know that I didn't mention them. Lupita for the record. I know that there is polar bear calving. The polar bears do come up into our mountains and they calve up here. Be aware that they are calving. I know that there's special consideration for our polar bear right now, especially with that new treaty that's being issued so there's some protection for our polar bears that Fish and Wildlife already put into place in some of these areas so I would like to make mention of that to take a look at that. That way when we, when we come back with another scoping you have a projected map with those markings on there. That way we could see it because I mean it does say River Uplands Special Area but it doesn't really say what it's protecting, why it's protecting... (Point Lay) (BLM 2019b)

[Point Lay resident] will attest that they'll den close to the old village. And you can find polar bears almost anywhere. All they need is a snow drift to den in and they do. We'll find them along the barrier island. They're not in the numbers that you might see in Kaktovik and Point Hope. (Point Lay) (SRB&A 2011a)

She said they have lived subsistence living as their forefathers did also. They traveled with animals. They survived on animals. And she stated that once...the polar bears, they live on ice, but the females, when they tend to their young, they don't live on ice. They go towards the land and the rivers. Go towards the rivers to tend to their young. The fish travel towards land when there's no ice, when it's easier. And then they out to the ocean when it starts freezing up. And she states that animals know fish go towards ocean underneath the ice. Sarah Kunaknana through translator. (Nuiqsut) (MMS 1979b)

Whales

In the past we have -- we have seen a lot of ice making it difficult for us to go out to the main open water. Now you don't see that. In recent years, once the ice goes out, you don't see it. It don't come back. Now that will change the pattern of the migration of bowhead whales. They will be traveling closer to the shore, closer to these barrier islands in the 30-meter mark, and that's where these marine vessels like to travel from. And that has been their pattern since the ice pack had gone further north, 100, 200 miles north of us. And since then, all these bowhead whales have been traveling a lot closer, and some are traveling inside the islands. And now they migrate -- they use these islands as more of, like ice because they are shallow. Thirty-meter mark is real shallow. And if we cannot -- like Archie Ahkiviana said, we had a successful season in the past couple years because the whales were closer to the islands and we did not have to go further out, no more than eight miles out to -- to catch our harvest. And a lot of times we may be weathered in because of the weather, high seas. Edward Nukapigak. (Nuiqsut) (MMS 2009b)

Seventy-five percent of our food comes from the ocean. We get some of our food from the land, but the ocean is our garden. Whales, beluga, walrus and seals are all foods we need. OCS is something people are concerned about because it can contaminate our garden. We know about Prudhoe Bay. The tundra is fragile and if you scar it, then it will last for years. We have seen that with oil development. But, if you spill oil in our garden, the scar will be forever. (Utqiagvik) (Inc. et al. 2008)

[We hunt in] June, July, but it has been earlier these past few years; it used to be July but you can say June now. All the animals come early, even the bowhead. They used to hunt them in May and now they do it in April. Animals don't have a calendar. Maybe it is the climate that lets them move back and forth. Whales have been coming earlier. (Point Lay) (SRB&A 2014b)

If we don't have any down there [Cape Sabine], we'll come up and scout around there. We've herded them more down there more often than we've herded them from up north. We go out here, and then we go this way [toward shore]. We don't want to cut them off and scare them back to where they're so far away and we have to wait...it's safe to say five miles [offshore is the furthest they go when beluga hunting]. I think we've gone as far as Eleven-Mile [Akunik Pass] to turn them around. Those are reference points, so you might go a little further than that...[you go to] whatever inlet you're nearby.

You can lose the beluga real quick out there. You herd them in through the closest inlet. (Point Lay) (SRB&A 2014b)

3.3.7.2 Health and Quality

The bearded seals used to be fatter. They're not fat at all. They travel more, we hardly see them, that's why there's a short time [when they are] around. I bet that's the problem with the beluga, too. They're not as big as [they were] a long time ago. (Point Lay) (SRB&A 2011a)

A lot of sick seals, [ringed seal]. Couple of bearded seals me and my crew got their hair wasn't all there. They were already molted, the big ones anyway. I found maybe five or six eider ducks dead. [More than usual]. It was, I think it's the heat. Yeah. There's a lot of sick walruses, seals, a few I saw bearded seals, ducks, eider ducks. From Eleven-Mile north that's where I saw most of the sick animals. (Point Lay) (SRB&A 2013a)

I have been butchering seals for more than 20 years now. I can safely say in the last five years I have had six seals uneatable, unusable to where I had to just throw them out, throw them back into the ocean. One of the -- I did have them tested, and it did come back malignant with cancer. So another thing to be watching out for, too, for these ships that are going is the waste that they are putting in the waters because it is affectic -- it is affecting all these -- the bearded seal, we hunt that for kiniqtug and misigaq. And that's one of the things that is important, too for our well-being. Take a teaspoon of misigaq, and that's better than Dimetapp. It really is. You know, you -- it may sound funny, but -- beluga oil, you rub it on your chest for a chest cold. We use it more for than just food. Roberta Leavitt (Utqiagvik) (MMS 2007b)

3.3.7.3 Climate Change

Animals were only available during very narrow opportunities because of the weather, the sea state conditions, and the early warming. We not only lost our ocean ice early, we also lost all our beach cover early as well as [losing] all the ice in the inlets early. [There was] no way to really go any farther than 20 miles without dragging a boat with you. But yet the lagoon ice was very thick and did not go out until the middle of July so we couldn't use the boat ramp to launch our heavy boats. All the weather conditions worked against us. We have to adapt to it; it's normal. (Wainwright) (SRB&A 2013a)

If you look at everybody else's data, there's a one week period in August that everyone got bearded seals. That was it; that's not normal. We usually get them all the time. It's because there's no ice; it was all blown out to sea. Not having no ice. We had no ice, open water for about 200 miles all summer long. It was pretty hard to use the ocean because it was too dangerous. There was that one week period that they had gotten those seals. After that, nothing. When that opening happened I wasn't home so my boat didn't even go out in the ocean. (Wainwright) SRB&A 2013 (SRB&A 2013a)

The seals typically come the middle of June, and we're here, we're waiting, people are struggling to get their boats launched because of the soft sand and there's no seals. Wide open water. The conditions were a little choppy, and then one day toward the end of June about the same time I started getting hits on the fish finder then the seals come, and we had—it was an amazing hunting window. Almost two weeks of perfect weather. (Wainwright) (SRB&A 2013a)

The ice conditions; I noticed the ice isn't thick as it used to be 10 years ago, 15 years ago. Even last year, too, wasn't as thick as we'd like to see it. They're probably going further north just to find good hunting grounds because there's hardly any ice. (Point Lay) (SRB&A 2014b)

I've noticed that the shorefast ice has come closer and the lead opens up closer than it used to when I first moved down here. I went out seal hunting one time and my speedometer said 15 miles and I just looked down, and I said 'Hey boys, we're going back; this is way too far for me.' We didn't even reach it [the lead]; we had two miles to go. Nowadays, it opens up two to three miles out.... I think it made it easier

for our subsistence activities to have an open lead closer. We would have to go north, you know, to find closer open leads. (Point Lay) (SRB&A 2011a)

3.3.7.4 Effects of Development on Marine Mammals

...there are other persistent organic pollutants that are concentrating in our animals. There are studies of the polar bears that are showing these concerns. These pollutions from industry developed elsewhere are coming to our lands with the way the air currents are and the precipitation, they are coming to our lands and we did not have to identify the issues, but we have to deal with it. This adds to what is coming from the fields of Prudhoe Bay, Alpine, and Kuparuk. There are changes to the animals which are our resources for survival, the fish, the caribou, the whale, and others. (Nuiqsut) (BLM 2003b)

People that use the ice road leave trash, and animals eat that trash. Caribou and polar bears—have trash inside of them. Seals—plastic pop rings. Within the last 5 years, on the ice road, [I] see a lot of trash all over (S.R. Braund and Assocs., 2003, Field Interviews, USDOI, BLM, 2004). (Nuiqsut) (MMS 2007a)

3.4 Social Systems

3.4.1 Landownership and Uses

See traditional knowledge provided in the SUBSISTENCE USES AND RESOURCES section for traditional knowledge that is also applicable to this section.

On the issue of the Haul Road. The direct environmental impacts of the pipeline has been limited and manageable. Issues associated with the Dalton Highways or the Haul Road and their relationship to the pipeline issues complicate matters. Clearly, the Haul Road and the pipeline are related and the management of the two assets must be a coordinated undertaking. The State of Alaska, over the strong objections of the North Slope Borough opened the Haul Road to public traffic. The ongoing and potentially serious impacts associated with the Haul Road must be considered together with the pipeline for purposes of impact assessment. Originally a restricted industrial supply route to the oil fields, the Haul Road is promoted in a lot of travel magazines as one of the America's great frontier driving experiences. This attracts more and more travelers every year to a road that was not designed for public use and is not adequately maintained for public travel. There is a critical shortage of sanitary waste, emergency facilities, including toilets, waste receptacles, roadside pullouts and call boxes. Drivers of 18-wheelers feel they have a priority on that road, just drive it one time and you'll see it, as was the intention and the case since the highway was first constructed. Slow-moving or stranded passengers vehicles can create dangerous situations out there. It is, of course, the North Slope Borough which must respond to emergencies on that very road within our boundaries. This is an added expense to us, to our local government and diverts limited response equipment and personnel from potential needs in our communities. George Ahmaogak, Sr. (Utqiagvik) (BLM 2002).

The eastern bank of the Colville River is virtually not a subsistence area anymore. And that's probably - you know, if your research people look at that, that's an overwhelming fact that it has happened. Although, in the comprehensive planning in Prudhoe Bay, the industry, State of Alaska had assured us that they would not restrict hunting, they have barred and restricted hunting from the eastern bank of the Colville River to the Sagavanirktok River already. (Utqiagvik) (BLM 2004f)

My major concern is access to areas we've been using that may be developed and possibly we'll be prohibited from going in there. That's a major thing I've seen with what's happened in Prudhoe bay and the Kuparuk area. You go through Deadhorse to Barrow and a number of times I've been denied the ability to go off the road system. A snow machine on the road is a bad idea. I went from Deadhorse to Aluktak and had to hire a trailer and truck to carry my snow machine. (Barrow active harvester; Experience timeline: 1995 and ongoing; Experience location: Prudhoe Bay, Deadhorse, Aluktak. SRB&A Interview 2007) (SRB&A 2009)

All the western side of the Colville River and the rivers that they used to harvest game, to harvest fish, waterfowl and to use as camping areas because traditionally, these areas have been used by their forefathers. They continue to try and do this but what do they do? They are blocked completely by the industry. Even though that it's written, it's black and white on paper, Native people could subside in these areas, you try and do that, you get jailed. (Nuiqsut) (BLM 1998c)

3.4.2 **Cultural Resources**

We have not been able to have access to our traditional hunting grounds that we were raised with...The Inupiat have a close relationship with the land and animals. It changed the spiritual need between the Inupiat people and their traditional hunting grounds because they had a very close relationship between land and animals. Jonah Leavitt. (Utqiagvik) (Worl and Smythe 1986)

To understand our culture is to understand the correlations of history, archaeology, socio economic factors, land and wildlife factors to a livelihood of subsistence patterns of the Inupiat people. The relationships of history and culture cannot be separated. The same is true for subsistence resources and the human food web process, including organisms of the smallest regime. The total regime of sea mammals, fish, land animals, birds, and caribou is all interrelated and dependent upon each other. To destroy one small part of the regime is to endanger the other parts. One begins to wonder if the hierarchy of State and Federal Governments understand these inter relationships of the total ecosystem as a whole. The total ecosystem provides the network for the continuation of a subsistence lifestyle. Flossie Hopson. (Utqiagvik) (MMS 1979a)

Cultural resources along the Beaufort Sea coast are not defined in terms of architecture or buildings alone. Beyond such static material categories is a whole panoply of dynamic resources. Spiritual associations with places and activities shared by local residents, subsistence hunting, fishing and gathering pursuits. John Carnahan (Utqiagvik) (MMS 1979a)

Cully Hill is the original graveyard for Point Lay, and we started another one by the freshwater lake. There's been people lost up and down the rivers and you occasionally find skulls. These are old war grounds. You'll find places where they made spearheads. This is where Point Hope and Barrow used to fight. You'll read a lot about the war grounds. Kukpowruk, at the base of Igloo Mountain, there's a lot of stones there. One story, that [a local resident's] parents told was that they were taking dog team down there and suddenly it started snowing red, and that sounds like fallout to me. These are two well-seasoned travelers. You have to wonder what was going on....There's a couple of sod houses at Kuchiak, just south of the mouth. Every river is significant. Pigmiaq River, at one time when Point Lay had only one man here, he was born at the mouth of Pigmiaq River, and there's sod houses there. Just south of it. And the coastline is encroaching, so at some point those are going to erode away. Cape Sabine, we used to go there all the time. When Point Lay was unemployed, Cape Sabine was a common place for people to go there. (Point Lay) (SRB&A 2014b)

The old village, right across [from the community]. Where the plane is on the landing strip [on the map]. We have old sod houses and graves. The second one is across the river. We lived on an island. That [on the river] used to be the second village. [The first village] was an island. The houses were lined up. All the houses would get buried. This is the third site. (Point Lay) (SRB&A 2014b)

So, I know that this area right here like Jane was saying, the Kasegaluk Special Area that is protected right here, well there's the Tuniluk River right here and there's the Tuniluk Lake and these are all historical spots where our people were, a large amount of our people and it's in our record. So, I just want to point that out that I would like to have this site right here protected. (Point Lay) (BLM 2019d)

The main one is up here [at Icy Cape]. There is a well-known Native village there. I want to see it [designated] as a historic site. One time my dad would say there used to be a thousand people there. (Point Lay) (SRB&A 2014b)

I'd just like to emphasize the importance of the Chipp, Ikpihpuk and the Colville River areas historically and still today. (Utqiagvik) (BLM 1997b)

My mother is from Oliktok. When they were developing Alpine, the "rollagon" almost stepped on my mother's sister's grave: the industry never apologized to her. That would be my strongest point. (Barrow active harvester; Experience timeline: 1999; Experience location: Oliktok area by the mouth of the Colville River. SRB&A Interview 2007) (SRB&A 2009)

The Haul Road was built right over my grandfather's mother's grave. My father brought up the concern. The answer was given as "It was the other company's fault." Gravesites and campsites should be documented. No mitigation was done. It might not have been the only grave there. (Barrow active harvester; Experience timeline: 1976; Experience location: Dalton Haul Road. SRB&A Interview 2007) (SRB&A 2009)

Narrow view of sites. We got grave markers and burials. In the winter we have markers, but they're buried by snow. You get oil companies driving all over the area. That's not right to do. We are Iñupiat. We respect our elders. (Barrow active harvester. SRB&A Interview 2007) (SRB&A 2009)

We went seal hunting during May and in June, before breakup, we had to land again. The islands are used heavily for nesting and molting ducks, geese and pintails. The islands are important and have historical and cultural significance. There are whale bones and old ruins at Pingkok Island. The lands and its wildlife, fish, have changed today. For example, Putu used to have a free flowing channel. Now, last year, it had to be physically channeled. Two years ago, my brother Paul went to fish at Itkillikpaat where he ordinarily fished. He came back with no fish. We used to catch fish anytime we put a hook in. The Itkillik River is now rusty colored. There are even a bridge at Puviksuk. This river used to be glassy clear, as I have known it. These are the effects of past activity. Bessie Ericklok. (Nuiqsut) (MMS 1979b)

Our family stayed at Prudhoe Bay until the late 1930's. Our old sod house is still standing today. When I visited last summer, I saw the pingos we used for duck blinds was a burning pit. Our place is a barge landing place instead of a fishing camp site. I guess people that are aware of Prudhoe Bay know that old shack on the east dock. That's where her house is still in position. That's the one she's talking about. There are a lot of old sites, camping sites, fishing sites along the coast line. The are there and are being threatened by development. Sarah Kunaknana. (Nuiqsut) (MMS 1979b)

The oil companies travel doing seismic and surveys outside right now with snow vehicles. They should watch what they are doing. They don't know what they are stepping on. There are some graves out there they are running over. I see a lot like that. There is a graveyard southwest maybe 20 miles from here and some survey people don't care what they are doing. Do they have a monitor? Do they hear what Native people say, not to step on or run over [a grave] - a dead person might be under it. Don't just ignore the stakeholders. Watch what you are doing. There is a graveyard out there. It was there before you were there. They did not dig down far in permafrost. Not just one graveyard out there, there are more. (Nuiqsut active harvester; Experience timeline: 1999; Experience location: Fish Creek; Judy Creek. SRB&A Interview 2007) (SRB&A 2009)

They are still recognizable if you know what you are looking for. I think it was AARCO at the time who contracted an archaeologist on west side of the Colville. Settlements about 3-400 years old over there. Still some remains there that people were living there. He was showing me the old bones with cut marks, the fire pits, the sod depressions. I would say that happened within a decade. When HDE was first coming on before the project. It was either AARCO or the state or both that contracted him to look for sites on both sides of the river. And he has found several more not just in the crossing but going east. (Nuiqsut) (SRB&A 2012)

There are a lot of unmarked trails up there. A lot of history actually. A long time ago before development when they were living in sod houses and dancing there was a lot of trade in caribou and muktuk. That is how they would do it. They would do a lot of trading in the winter and do a lot of hunting in the summer time. (Nuiqsut) (SRB&A 2012)

Not so much on the ocean coast, but [I have spent time] on the rivers. Last year when I was working for Umiat, they didn't tell me but Umiat became a historical site and you can't take anything off of the ground. I found an arrowhead and I put it in my pocket. I showed everybody and they were like "No". They freaked out about that. I got kind of mad at them because I was like "Go ahead and put it back then or are you going to keep it". I found a pair of old metal binoculars. I had to leave them though. (Nuiqsut) (SRB&A 2012)

At Oliktok there are old grave sites. I think they have been covered by the gravel. It is a desecration. My grandfather was born and raised there. I am sure one of his parents or both are over there. (Nuiqsut) (SRB&A 2012)

Yeah, I say that now because of Alpine we have had some displacement of camping sites, fishing sites. Some families have abandoned because of the development. The impact of noise and traffic and the infrastructure itself the roads and facilities. They tell us we can use our camping grounds to hunt and fish but it's just not... And besides that with the fire arms these days the industry is wary of that. (Nuiqsut) (SRB&A 2012)

Yeah, that has a lot of history there. That was a route that the Barrow folks used when they went to the trade fair (unclear) site at the Nigliq Channel. So that, as well as that being a very sensitive area for the calving areas for the caribou, apparently, that's more or less overlooked because you're already talking of having a number of drill -- drill pads with 50 wells on them. (Anaktuvuk Pass) (BLM 2018b)

So we have on record, of people that resided there well before Nuiqsut was even there from -- from our people. It's on state record, also, of who was there. They have names and people and they're -- they're our direct kinfolk because they were our last names; people with our last names and our immediate kinfolks... I'm just asking, because we have kinfolk that are buried around that area there. (Anaktuvuk Pass) (BLM 2018b)

There used to be some people in Itkilik; there were allotments in Itkilik Lake. (Anaktuvuk Pass) (SRB&A Unpublished)

The nomadic lifestyle would have some activities over [in the project area]; there might be some grave sites in that area. The Inupiaq people would travel there, and when a loved one died they would bury them in that area. So the Alyeska pipeline might have affected some of that. (Anaktuvuk Pass) (SRB&A Unpublished)

We would find some old graves. A real long time ago, people would build [graves]. And they would start drilling and [find] some old bones. I said "2,000 years ago the last one was buried". There was caribou skin right there by the camp fire. I know over there in this area [gestures broadly to the map], it might be the same. They lived here a long time ago. This [TAPS] pipeline goes through the graves. During the starvation my wife's dad was three years old. He was three years old when he was starving there. People were right by the river and it overflowed in the winter. And that's where they found them [dead]. [speaking about the graves or bones by the rivers]. (Anaktuvuk Pass) (SRB&A Unpublished)

[Important places?] All the elders know, nobody else [knows about the burial sites]. People died in that area right there [west of TAPS]. When the person died, they called that area that person's name. [When a] person died there they called that place his name. [Do people still use those names?] More people [are] traveling over here because more animals are over here. Down, up, the mountains, and up and down. (Anaktuvuk Pass) (SRB&A Unpublished)

I travel all over place, what it is. [I] travel to the ocean from here. [I travel to the] Colville River. People from here and people from north they go right there [to the Colville River]. They make something down here they make something there, [and] they go and trade [these items]. That's how they used to be. There was no store here, it's a long way to the store. [We had a] dog team [in the] winter for groceries [laughs]. They know what month they [are supposed to] go to meet, [in the] springtime. They know where to find each other. Mostly the people live right here live here most of the time [in Anaktuvuk Pass]. People over

there leave from Porcupine [to travel to Galbraith Lake]. It used to start a war, a long time ago. [If an] Eskimo find an Indian he [would] kill him. A very long time ago, [there was a] big war. Down south was the last time they had war. Only whites went back to Arctic Village. They made a story on a tape recorder. They said, "talk Eskimo so that they couldn't understand Eskimo". (Anaktuvuk Pass) (SRB&A Unpublished)

It's the same thing that can happen when the pipeline is open to the public; we know people have no sentimental value [when they visit] up here. But for us [this area] has a great sentimental value. (Anaktuvuk Pass) (SRB&A Unpublished)

3.4.3 Subsistence Uses and Resources

3.4.3.1 Key Subsistence Harvesting Uses and Locations

First of all I'm aware that Nuiqsut is greatly affected by these development proposals, but as he just showed caribou that migrate through Anaktuvuk Pass also travel up north to these areas and these herds are what our lifestyle here in Anaktuvuk is based on. And for thousands of years the animals that migrate north have followed their routes every year. These areas are summer home to the caribou, among other wildlife. The caribou that traveled north are the main source of subsistence for our people. Mike Morry. (Anaktuvuk Pass) (BLM 1998d)

Please stay away from the water. I don't know how many times we have to say it. These are the subsistence highways. Stay off the rivers and the big lakes because these are important areas for fish habitat that Craig just mentioned, and for waterfowl. Oil industry and water essentially don't mix. (Utqiagvik) (BLM 2003d)

We rely on fishes from Teshekpuk Lake quite heavily. The amount of fish that is caught from Miuliak (ph) River as it goes to the Ikpikpuk River is very popular. I've been in the area most of my life and these in the summer months. When I'm hunting in the area besides Chipp River. (Utqiagvik) (BLM 1998a)

That Anaktuvuk River, which is part of the, if that...lets take the Colville River, even west of the pipeline. Some of the project [components] get way up in here, and that effects the fish and the habitats for the animals that we eat here; the birds, the geese, and those kinds of things. Lakes sometimes are further up from the river, and human activity, I've heard this, that if the lake is kinda stationary and the river is not then that lake starts draining out, and human activities can do that. (Anaktuvuk Pass) (SRB&A Unpublished)

I use the general area around the Ikpikpuk up to Navy Creek for the last 15 years I hunted caribou and reindeer, there's a lot of reindeer up in that area. Fishers in the area catch reindeer annually. (Utqiagvik) (BLM 1997b)

My favorite spot would probably be right in here [12-18 mile radius around Atqasuk]. If there's hardly any caribou up here, I head out there. That's when I need caribou. That's a go-to place. My favorite hunting spot. The caribou are the fattest right there. (Utqiagvik) (SRB&A 2010a)

Wainwright, around Wainwright, the caribou seem to be fatter, less stressed. [I go there] in the fall time. Along the coast line all the way from Barrow, that's the one I prefer to hunt, the caribou seem to be fatter and less stressed because they come from the south, the ones that come from the east are bugged out. (Utqiagvik) (SRB&A 2010a)

We utilize that lagoon every year. We go all the way up to Icy Cape, sometimes even all the way to Wainwright. You know, it's sort of like a somewhat safe trail in case the ocean is too rough to travel. We utilize that lagoon to harvest caribou along the mainland shore. We harvest off of the barrier island that is there. We harvest eggs, which is going on right now this time of year. You know, we don't have to go to

the store to buy eggs. You know, there is a wide variety of seagulls, geese, ducks, terns. (Utqiagvik) (BOEM and BSEE 2013)

It's really more a way of life. As you know, subsistence is an unfortunate term, it's really a lifestyle. And gathering wild foods and that sort of thing, is, is super important in a lot of cultures, but definitely here. And you know you hear the cliché that whaling brings the community together. It's true, it really is true. It's amazing. People that have been campaigning against each other, all this kind of rough stuff, when a whale is caught all that goes away and food is shared. And that sharing hasn't changed. In fact, that is probably the single most impressive, or important, let's say, aspect of the way things are done here. Is that it's, it's sort of communal hunting. And the way people distribute food is really amazing. And you can tell it's absolutely genuine. (Utqiagvik) (Brown et al. 2016)

People fish in Chipp River in the fall time. The fish spawn just before October, early October. Or maybe more like the end of September. The bloated fish with eggs all come together and you get lots of them. Then all of a sudden the fish get lean. They've dropped their eggs and they get skinny. I catch aanaakjiq in lakes in the fall and they have suvak. One time I got two that were just big and round with eggs. I was holding the fish and that suvak was just draining out of it. The lakes are connected during high water of break-up, but then the water drops and the lakes get land-locked. The fish end up land-locked, too. (Utqiagvik) (Brewster and George n.d.)

When you catch reindeer near Peard Bay, that's part of Wainwright's herd. When you go over here to Admiralty [Barrow], that's part of the Barrow herd. The reindeer Nuiqsut gets, that's part of Teshekpuk herd over there. (Utqiagvik) (Mager 2012)

With hunters from seven villages taking animals from the Teshekpuk Lake caribou herd, it remains the most important herd on the North Slope from a subsistence standpoint. (Utqiagvik) (BLM 2003d)

I hunt seals every summer. Eleven-Mile [Akunik Pass], and Five-Mile [Kukpowruk Pass]...around that area. We get ugruks outside Eleven [Mile], and here too; both places. Usually they hang around on the outside. When there's ice out here, they're all over. We go all over when there's ice. That area over there [Utukok Pass], and about this far [Neakok cabin], all the way up and down for ugruk. Outside [the lagoon]. About three or four miles [offshore]. (Point Lay) (SRB&A 2014b)

I got three of them [wolverines] and four wolves. When the caribou are close by the town, I usually come around here and here [Kokolik] and here [Kukpowruk]. You get them along the rivers, mostly. Just up in here [foothills around rivers]. Deadfall Creek, around the hills. Last time I was chasing a wolf, it was a three and a half hour chase; we chased it from the coast to the river. Probably here where the foothills meet the flat land. They're right in the foothills near the flatlands, up to Utukok. (Point Lay) (SRB&A 2014b)

Kukpowruk is the main river there. You can go all the way up to fish camp. I'm gonna guess it's...gotta be this one. Kokolik, just for fish. Those are the two good areas. Everybody makes holes for fishes between that area and this area. (Point Lay) (SRB&A 2011a)

[We harvest fish] in Kukpowruk at the cabin, and we go to the school cabin and to other cabins. We start at the cabin there. We do that river and the Kokolik River. You can keep going up and then up to the coal mine. [We harvest] grayling, trout, during the whole month of October. At the same time we hunt caribou, wolves, and wolverine. (Point Lay) (SRB&A 2014b)

[We go] pretty much all the way from here [Cape Beaufort] all the way up to Icy Cape. [I go by] snowmachine and boat. [I hunt] black brant, emperors, white-fronted geese, king eiders, common eiders, Canada, snow geese...there's one good spot up here, right here [inland on the Kukpowruk], for Canada geese. There's a whole bunch of migration routes that they follow [crossing the rivers]. Inside the six mile, 12 mile boundary, too, for eiders. (Point Lay) (SRB&A 2014b)

[The migration pattern changes] only when helicopters [disturb them] or young people get too anxious to get them. Usually they can pass right between the snow fences right there. If we leave them, the first bunch goes through. If we leave those alone, the caribou will follow the scent of the first. But some young people like to get too anxious for caribou and go after the first bunch, changing the migration route. We try to tell them [not to hunt this way]. (Point Lay) (SRB&A 2014b)

When they come up, we herd them to shore. We stay close to shore, not even a mile out. One time we did that from Utukok Pass. We herd them from there. Usually when we hunt them from the south, we take them through Kukpowruk Inlet, and when we bring them from Icy Cape we bring them in here [Akunik Pass]. One time we herded them from the ocean, eight, nine miles out. That was not that long ago. Usually we spot them from the village and hunt them from there. We used to use airplanes, the last few years we haven't but it is good to use the airplanes because they spook easy with outboard motors. (Point Lay) (SRB&A 2014b)

This past summer I spent most of the time in Fish Creek Bay. And also on the west fork [of Fish Creek], the one that comes in on the bay side. From here I took about 10 to 12 miles in [to Fish Creek].... Caribou are out here [along the coast], but this bay is too shallow [so you can't reach them].... But there were caribous around here, but you don't have access to go to them because the majority of this area is too shallow.... But I focused my camping out here [Fish Creek area]. Teshekpuk herd tastes better. I've seen caribou when I've gone to Oliktok, when I go to pick up my supplies, from Pisiktaġvik coming down. On the east side, we have caribou but it seems like they want to stay away from the shoreline [because] we have so much activities going on. Here I only got a few caribou because in summer we have so many activities going on.... Majority of the caribou were on this side [west] of Fish Creek.... [I went] about maybe four or five times out on Fish Creek. I focus on Fish Creek a lot because I know that caribous on this side are being disturbed by industry. That way you don't have a lot of choppers flying every day. (Nuiqsut) (SRB&A 2016)

...in the summer when it is time to fish for large, round-nosed whitefish the place called Tillabruaq gets filled with them as well as the entrance to Itqiliq. Nigliq river gets filled with nets all the way to the point where it begins. We do not go to Kuukpiluk in the summer months. Then we enter Fish creek and that is where hunting sites and cabins have been built. That is where they build racks for drying fish and for drying caribou meat. (Nuiqsut) (BLM 1998c)

That Fish Creek area is most popular fishing for Nuiqsut for the fall time. Summer time around Nigliq Channel. So it's most popular fishing. So if that's happened, if the oil -- if that bridge pipeline broke up, there will be more devastation on our fish out there, especially the seal on the mouth of the rivers. There's all kinds of seals out there, there's all kinds of birds. So if there's an oil pipeline break up on that bridge, boy, you're going to have -- devastate our wildlife out there. (Utqiaġvik) (BLM 2003a)

The reason I was disagreeing on the numbers is I have a campsite near the mouth of Fish Creek and I take my family there every summer, every spring, summer and fall. We geese hunt down there in the spring. We set nets in the summer. We hang fish to dry. All the time, we go caribou hunting for the prime caribou in the fall, the one that's -- that's the best time to get them, but during all those three seasons, I'm still hunting caribou, taking my family down. Now I've got my grandchildren I'm taking down this summer and we were down there a couple of years ago. A nice herd came through. We got a couple of nice bulls and I didn't see you down there and I'm just -- all these assumptions and these good numbers you're getting from a collar or two in the area, I just -- I just have to disagree with that. (Nuiqsut) (BLM 2014c)

The residents of Nuiqsut use Fish Creek in their subsistence activities. In addition Nigliq area is used extensively where they do their fishing and in the summer months when the fish enter it, fish nets can be seen all the way down. (Nuiqsut) (BLM 1998c)

We go here near the Kuparuk River and here along the Kikiakrorak and Kogosukruk rivers. That's where we go for furbearer hunting. If we don't see anything we'll go to White Hills. (SRB&A Nuiqsut Interview November 2005) (SRB&A 2010a)

[Speaking about the rivers he uses for subsistence hunting and fishing]: The principle one, of course, west of Colville that I used to pursue subsistence resources are Uglooktok (ph) River, Judy Creek and Fish Creek. Judy Creek. (Nuiqsut) (BLM 1998c)

What they said about fishing for whitefish at Kuukpik is true. While that is true, it is most true that another place where they fish for whitefish is Nuiqsauruaq. You also know that from here all the way to the end of (?) those fishing for whitefish would fish from the frozen waters. (Nuiqsut) (BLM 1998c)

They'll go boating down towards the mouth of the river out to the delta at far as an hour out to the sea to get seals and things that are with animals or birds that are prevalent down there, but not old squaw ducks and those other little birds that were mentioned earlier. And sometimes when the route is good, they'll go to the Fish Creek and around -- and especially through the Nugaluk (ph) Channel for these things. (Nuiqsut) (BLM 1998c)

[The Teshekpuk area] has been used by subsistence hunters ever since he could remember. It's the area that when other areas within the close area of the villages like in Barrow, there's no game of any type, people usually go to the Teshekpuk area to harvest game that they don't have in the close proximity of various village. (Nuiqsut) (BLM 1998c)

Kowalski, Nageak, Obie (ph) all stated in the EIS that the Village of Nuiqsut hunt for fish and game at the Colville River. That is completely wrong because when the fish are there, all the way from where the boats are docking, that's down here. All the way down to the mouth of Nagaluk (ph) they put their nets. It's true that during the summer, that (Inupiaq), they put nets there, yes, but for whitefish, this is -- this Nagaluk (ph) River is what they use the most. And then if they cannot do it there when the bay opens up, they go through the fish screen and use that area also for fishing. The Ulutuoooh River which is really close from here and it bends like crazy like a snake, there's no fishing there. They don't I fish there. It's the Fish Creek area is what they use so everything that has been stated in that EIS is completely wrong. (Nuiqsut) (BLM 1998c)

Another thing that we have been given as the point that we can hunt for moose is the area at the mouth of Anaqtuuq. We have been told that we cannot hunt for moose past it. We cannot hunt past it, we've been told. When the residents of Nuiqsut begin hunting for moose, they are not able to get a moose right away and very often get a moose right at the end of the moose hunting season. The village of Nuiqsut is not like Barrow. When you live on the coast, like Barrow, there is a lot of game to catch. You don't have to travel very far either to catch it. That includes the geese, and seals, etc. But when you live inland, like Nuiqsut, you have to travel quite a distance to the coast to hunt...The hunting grounds extend all the way to Fish Creek. (Nuiqsut) (BLM 1998c)

For some reason our caribou on the west side didn't come. They wintered, summered, and wintered again in Wainwright. So the pattern is changing, maybe because of the industry is expanding and that's how we look at it. Because all this west side is undeveloped so why is that when you're supposed to be there, why aren't they? (Nuiqsut) (SRB&A 2014a)

To set our nets we have a tool that is a 15 –20 foot stick with a hook on the end. We cut through the first hole and then drop the hook with a weight attached. We move to the second hole and pull the rope using the tool in that hole; then move to next hole and pull the rope again, until all the holes have the rope connecting them. The net then gets pulled into the water and lies under the ice. Everyday we have to cut through the ice by hand to check the net; the thickness of ice is about 2 to 3 inches. This is all done in the cold, no tents and no warm-up shack. It takes one person 1 to 1.5 hours to perform this activity. The nets must be checked every day that takes about 20-40 minutes. Fifteen to 18 miles at 40 below and then finding one or two fish. It isn't fun after a while.

You can see the frustration; frustrated not only with industry, but the State and agencies, because, "How could this be happening to us?" We used to be a thriving fishing community. Now all of a sudden we get two to three cisco. It is very frustrating to an individual and as a family as well. You spend time and effort and money. The average family will set two nets, sometimes three nets to try to make up the loss of one

net. It takes a lot of money to fish; prepare the snowmobile, buy gas and nets and you have to spend time away from your family and home. Our diet consists of 30-60% Arctic cisco. (Nuiqsut) (MBC AES 2004)

I just wanted to add in the 25 years I've been going to Fish Creek with my family and seen the caribou come and go, I've gone up the river all the way up to Judy Creek seeing caribou. I even got a couple of reindeer one summer and all these groups, even small groups, two or three, even larger ones, I've not once seen a collar on any one of them in the 25 years I've been hunting in that area and it scares me to think that the next generations with this GMT1 going up, are not going to be able to experience the good hunting that we have in the Fish Creek/Judy Creek area and I just wanted to say that now while I have a chance before this thing is over and I just hope you folks take that to heart if you have children or grandchildren, I would hope that you will listen to what's coming in the future. (Nuiqsut) (BLM 2014c)

3.4.3.2 Noise, Traffic, and Human Activity

They're too far out, too far from the rivers. Gotta be lucky [to get them] when they're migrating, but they never came through last year. Now they're over toward Atqasuk. There's none over there. People gone to Umiat and back around. Like I said they were at the dump for months. Traffic, when they start putting in all those ice roads, constantly going back and forth. The roads and stuff scare them off, the congestion and we have to go further to get caribou. Three years ago people were going 75 miles just to get caribou and that's ridiculous. Just the oil companies, the ice roads. I heard that's what's been keeping them away from town. Go back and forth on the ice roads, it's putting a hamper on it. Once the ice road gets built there's equipment and congestion, seems like they go further [the caribou]. (SRB&A Nuiqsut Interview March 2009) (SRB&A 2010b)

Well, the wildlife, I think it's just the timing of the studies, the month of the studies has an impact. In the summer. Even the wildfowl notice, starting in May that's when they're really active doing their studies and that's a prime time when our local folks are trying to harvest their meat and they're being interfered by their summer activities. That's what it is. Just the changing of the pattern of their studies. (Nuiqsut) (SRB&A 2010b)

When I went camping last year, I waited 3 days for the herd, to have a helicopter to divert them away from us. When they were diverted, we went without. We have had to deal with harassment. We had overflights three times while trying to cut the harvest. It is disturbing. The next year we had a helicopter do the same thing, but it was worse. They were carrying a sling going from Alpine to Meltwater, another oil field. It went right over us three times. The herd was right there, and it put us at risk. I had my two young sons with me, and it made me very angry. What am I to do when the activities that have been handed down for thousands of years to our people are being changed by the global need for energy? (Mayor Rosemary Ahtuanguaruk, USDOI, BLM, 2004) (Nuiqsut) (MMS 2007a)

That would be a lot of people if they built the road, like the haul road. The haul road [was] not supposed to be open but for commercial drivers. But now it's open for everybody. Every year they go back and forth. Trucks, cars, everything. [There are] more guide hunters. (Nuiqsut) (SRB&A 2012)

We experienced four years of no caribou with -- because of aircraft noise, mostly with helicopters and our migration - Western Arctic Herd that came from the south was diverted inland to where for four years, we had basically no caribou and the caribou that we had were... Real skinny, no fat caribou and it was four years, you know, even -- even we got so desperate for caribou meat, we had -- some people went up to Icy Cape, even myself, and also we went up to Wainwright just to harvest caribou. (Point Lay) (BLM 2014a)

Caribou hunting I see a lot of helicopters going back and forth and might change the migration of the caribou. Last year I was out hunting for two weeks and only got four caribou because of them. I don't know what they were doing. I didn't make them out but all the caribou were gone. (Barrow active harvester; Experience timeline: 2006; Experience location: by Meade River. SRB&A Interview 2007) (SRB&A 2009)

They claim that the caribou herd is healthy with numbers, but the only caribou I got last year was bad. Twenty caribou were harvested in October when we could access areas not accessible by boat. Seventeen were sick. When I went camping last year, I waited three days for the herd, to have a helicopter to divert them away from us. When they were diverted, we went without. We have had to deal with harassment. We had overflights three times while trying to cut the harvest. It is disturbing. The next year we had a helicopter do the same thing, but it was worse. They were carrying a sling going from Alpine to Meltwater, another oilfield. It went right over us three times. The herd was right there and it put us at risk. (Nuiqsut) (SRB&A 2003)

Last winter, nobody caught any caribou within 100 miles of this town because they were doing exploration on both sides of Teshekpuk and on the east side of Ikpiukuk. Last year, not a single one came through. They were all herded from the Ikpiukuk to Teshekpuk area toward Nuiqsut and Nuiqsut hunted them all winter. In Prudhoe Bay there was a union agreement that they could hunt wherever they used to - Nuiqsut - I'm using Nuiqsut as an example because they're right smack in the middle. This pristine land has been their hunting grounds. It starts from onshore and goes off. My dad was at Beechey Point. He was born there and grew up there. They used to pull up flounder and sole. The last time they tried that, 10 years ago, they hardly pulled up anything and they were very scarred and skinny. (Barrow active harvester; Experience timeline: 1996-2006; Experience location: Teshekpuk, Ikpiukuk, Wainwright, Atkasuk. SRB&A Interview 2007) (SRB&A 2009)

Don't follow the river. Because that is what they are doing. That is where the hunters are. That plane I wish and the chopper I wish they would reroute instead of following the river from Umiat. (Nuiqsut) (SRB&A 2010b)

It comes back to my whaling experience. Be quiet on the ice. No drilling on the ocean. It will affect us as hunter-gatherers. The noise drives the animals away. (Wainwright) (SRB&A 2009)

I heard they are always counting the caribou through helicopters. One time before Alpine had happened, they did a lot of caribou stuff by Piniqtuk and they noticed they used chopper and planes to scoot them away from the area where they planned to build Alpine. Then they say helicopters don't interfere with the migration. I think they always be together when they start coming in, the main herd that stay together. Then one lone caribou [makes it near Nuiqsut]. We always wait long time for caribou. Then July we're hungry because we got one in June, waiting for August. How we gonna get the meat from the store, it's expensive? \$16 a steak. (Nuiqsut) (SRB&A 2010b)

[I] believe all of our caribou migration routes during the time that they are in their seasonal migration turn that those, those drill sites need to be turned off to allow our people to go out after them. Sometimes when you have too much loud noise during the caribou, they'll change their migration route and looking at the area of impact that our caribou are running through all that area I believe our caribou migration route should be protected. It needs to be logged and protected because of the decline in caribou. That's a resource that we use here every day on a yearly, we are every day, all year, 24/7. (Point Lay) (BLM 2019d)

Well the planes do come, but it don't scare them. No, the helicopters are the ones that scare the caribous. (Nuiqsut) (SRB&A 2015)

Hunting caribou; when we hunt caribou on the tundra where there are no trees, you've got to be very unobtrusive, there's nothing to hide behind. We were up at our camp, and this has happened many times, were sneaking up on the caribou, and over a hill, bingo, there comes a helicopter; there goes the caribou. Same place, different time we went up there. There are signs all around that the caribou were there, but then there are ruts, deep tracked ruts in the ground where there have been vehicles, tracked vehicles. Caribou don't go where they've been chased out of. Over a couple of years, they change their activities. Same area, they have restrictions on activities, and some drivers didn't follow there where they were supposed to, and some broke through the river and spilled oil and left various foreign objects and never cleaned it up. That's part of why there's no fish there. About this time of year we'll take off on our snow

machines and go wolverine and wolf hunting. Where do we go hunting? We go right here at Cape Simpson but there aren't going to be any out there. And what about all the money and time it takes to do this? I'm debating if it's even worthwhile. (Barrow active harvester; Experience timeline: Since 2000 and ongoing; Experience location: Chipp 6. SRB&A Interview 2007) (SRB&A 2009)

These caribou been so far out, so I started using four-wheeler [to hunt]. All these caribou start being away from the river. Last year, every time there's caribou, [they are] away from the Colville River, about five to six miles. Some are close to the river sometimes.... We got a cabin down here and caribou are way, way out here instead of close to the river. There's too much traffic. Airborne [traffic] is one of the problems we had. That really affects our hunting. (Nuiqsut) (SRB&A 2010b)

[I caught] less [caribou compared to the previous year], same thing – [it was difficult to hunt] with the helicopters and low flying planes. And there's actually rolligons that go, when we go up and Puviksuk there's one really big hill and we could see a whole bunch of rolligon trails. There were hardly any [caribou] up there. (Nuiqsut) (SRB&A 2014a)

Where the hunters are going out 30 miles to get caribou and a chopper that's doing study of the area tested by the industry, that industry will not take terms or responsibility for that impact. The State of Alaska, same thing, as well as the federal government. There are no mitigation impacts to these hunters, so therefore, you have a diverted caribou as well very interfered and upset hunters. It's been like this for many years. (Nuiqsut) (BLM 2004d)

Like I said I wasn't having any luck in this area [near Fish Creek]. I think it is because they were looking at GMT1 [surveying the area]. I got satellite collar imagery, and it is really familiar to – the caribou avoided the GMT1 area. They went around, it is because they are doing a lot of surveys over there. Helicopters. I've seen a lot of choppers inside Fish Creek. I ran into BLM out there. [The exploration around] GMT1 and Fish Creek are diverting the herd around their proposed development. The caribou are going south. A lot more activity this year, close to 1,100 Conoco Phillips helicopter flights. If you take a look a Cassin 6 and Cassin 1, those are wells, there is a big resemblance as to how and where the caribous are going. It has gotten worse. I can see with the caribou are not coming into this area. During the summer Conoco did a lot of studies over there. The wells, hydrology, UAF [University of Alaska – Fairbanks] is down there at Fish Creek, studying the fish. (Nuiqsut) (SRB&A 2015)

It was sort of like different from last year, for some reason they decided to go towards west side Harrison Bay area. That's what happens when they were being crowded by planes and helicopters. I think they [industry] are starting to understand that during the migration of caribou, they're staying away [from those areas]. That was some difference we finally saw. Maybe that's the reason they [caribou] start coming through town. (Nuiqsut) (SRB&A 2015)

Also the helicopters – they are scaring off the caribou. We had to call the people around here and tell them to hold off the flight. They are always flying their helicopters around here [west of Nigliq, around the CDs]. I don't know [what they are doing] but they are from Alpine. Always out there from – well, out there year round. Well, summer time is the worst. They get water samples and stuff, and when it comes June for breakup, they always want to get water samples rushing from the rivers. It's already broken up and too much water. They always try and let the residents make money by guiding [them to those areas] but there is no way to get out there [poor conditions]. Planes weren't the issue this year for me, just helicopters. It was really affecting other hunters. (Nuiqsut) (SRB&A 2015)

Helicopter traffic. There was a herd that was coming from the east side going west and we were at our cabin on Nigliq Channel and when the caribou were coming in [closer to the cabin], a chopper flew over them and turned them around. At that time we were hunting for the blanket toss. Just when they were coming towards us, a chopper flew up and went straight towards the caribou. It was a blue and white one. My uncle was angry; he called them. He was so upset. It went right straight towards the caribou and it turned them around. That was in June. Just mostly helicopters. This year there was a lot of them. My uncle was sure mad when those got diverted. That chopper pilot knew it too. No they didn't care. No

regards. A lot of people talk about that. Town folk say a lot that the chopper activity was really bad. (Nuiqsut) (SRB&A 2015)

They [oil company personnel] are all on this side of the river. If they put CD5 there it would be a big problem. That is right around the area that we hunt. (Nuiqsut) (SRB&A 2015)

I didn't notice at Fish Creek actually surveyors but they were walking. And they were just being picked up by helicopter at the end of the day those surveyors walk a good 30 miles a day. I see some people walking over there. A lot continuously all summer. (Nuiqsut) (SRB&A 2015)

A lot [of traffic] continuously – all summer long. It's the surveyors. They're surveyors out there. I don't know who they are, but all summer long they're just there. I think they're the ones – I don't remember the color – but I think it's the same helicopter that takes off and lands at Alpine all the time, but they're dropping off these equipment for surveying and bridge planning – whatever they're planning – to make these bridges for these roads. Basically at Miluveach, they're really utilizing that area to drop [supplies] off. They just so happen to utilize the area where the caribou are. Wherever they're setting their camps and drill sites is the best route [for the caribou]. When these animals travel, they travel on the lowest slopes possible and the most level, and where these people want to drill just so happen to be on a [migration] route. Right at the creek, and this is a flat area. You can see clearly for at least four miles; it's so flat, you can see as far as you want – but they basically use these two mounds for grazing areas; they're the feeding grounds, and when the disturbance comes they force them to go to Pisiktagvik and then Alpine. The helicopters are flying from Northstar to there. And from Oliktok to Northstar Island, the offshore drill rig. Every time that helicopter came in they just scare them around and the caribou move to where they left. (Nuiqsut) (SRB&A 2015)

I grew up as a hunter. I knew, back in the mid-40s there was not that much game at that time. In the late 40s the caribou showed up, so that's what we hunted. In Pt. Lay we did not hunt whales. The caribou would be real close, two to three miles. They'd come from the south and go north. Throughout the 50s it was good. People didn't have to worry. Going into the 70s and 80s, that's when we noticed the pattern of the caribou had changed. They came from the North. They went further inland. It wasn't just oil, but more snow machines. I think a lot of it is our own fault. We were always told not to shoot the first group that came through. Any disturbance to the first herd, whether it's hunting, snow machines, or any kind of activities, the first part of the herd determines where they go. I know this. We cannot force the animals to change their path. Not just the caribou. We hunt beluga by Pt. Lay. If we make too much noise, my dad says we should wait for them, instead of looking for them. The outboards will change their path until they get by Icy Pt. I strongly believe any kind of disturbance will change the animals' ways. The animals know when they travel year after year, where to avoid. The beluga, caribou, ugruk. If you disturb the first bunch, you can bet there will be hardly any ugruk. When the barges go through, they make a lot of noise. When the DEW lines first came in there were a lot of barges. We couldn't hunt beluga there. We had to go 30 miles south. We know now if there's no disturbance we should just wait for them. (Wainwright) (SRB&A 2009)

Now for the trapping people that are here -- where they make their livelihood -- they're going to not be able to trap at all in those areas that are designated for exploration. We know this for a fact because we're not able to trap around Prudhoe or any areas now being explored. Raymond Neakok. (Utqiagvik) (BLM 1982)

It takes a long time for the tundra to grow all the way back. It will leave a mark. That is why they invented the rollogons to try and avoid the tundra damage. The rollogons will leave a mark in the tundra after the snow melts. (Nuiqsut) (SRB&A 2012)

I would say so [that TAPS has made subsistence more difficult], I have heard it mentioned from other elders and my grandparents. The people and the wildlife being displaced. Historically the Kuukpik people were nomadic along the coastlines. From the Brooks Range to the coast and east to west. We are settled now. We are here. We have the village here. Some of the campsites. I have heard of a couple of elders

who were born in the Prudhoe Bay area. They grew up there and were raised there and tried to get allotments and somehow there was trouble with them doing that. Staking claim to those areas. I know that there is at least a family to two that tried that. I don't know if they were successful. Here I mean people aren't used to staking claims for their area. Game was everywhere. There would be 100 families who would harvest. You didn't need permission from my neighbor. You could camp and fish where you wanted. It was shared land, shared waters. Now we have to stake claim and tell people when they are trespassing. We still do that today; a lot of our campsites are shared. No one is ever really denied. (Nuiqsut) (SRB&A 2012)

3.4.3.3 Infrastructure

Pipeline has really changed our caribou hunting because Porcupine Herd used to cross the river, cross the road this way and come out to our Anaktuvuk and Anaktuvuk Valley from east, it doesn't happen no more. Once they build a road up here from -- from Alpine area to -- all the way across to NPR-A, once they build a road it's going to change the subsistence just like every one of those coastal villages, if they build a road that's going to change their subsistence. (Anaktuvuk Pass) (BLM 2003c)

Pipelines; we have seen caribou turn back from pipelines because they [caribou] see a flash from the pipeline. They used to go to Helmericks' in the thousands, not any more. Maybe two or three or less. Especially females with young used to go down there. Westside at Kugaruk, Harrison Bay, there are caribou there. You always see them. We had to go out to the ocean and to Kugaruk to catch them. (Wainwright) (SRB&A 2009)

That migration pattern has gone southward. We hardly see the western herd this year. The Porcupine Herd, haven't seen them lately. We used to see thousands of Porcupine Herd coming through the villages, but we haven't seen those for a number of years and since that pipeline was built, that changed the pattern of the migration of the caribou. [We are] mostly harvesting caribou from Western or Central Herd. (Point Lay) (SRB&A 2014b)

The impact I would say would be the infrastructure. Caribou they like the pads because it is a sanctuary. They know they are not getting shot or hunted there. We spent a whole day just waiting on them to [cross over]. Right in Nanuq area. Some scattered caribou and wasn't large or significant. Three there, four there, one there, what have you. (Nuiqsut) (SRB&A 2014a)

I want to elaborate on ice roads that are used to connect ice pads. There were two pads that blocked the route to Kuupik from Oliktok to Amoniktuk through July. Usually these pads are completely melted and we can hunt seals. Generally we can take our boats and go across our hunting grounds but with this big iceberg in our way, we had to work our way around. Usually we have complete boat access at the beginning of July. Also when the cost of gas was \$4.00, we used to go by 4x4 in order to travel to Oliktok to buy cheaper gas. When construction was taking place, they would push the snow into the roads that we traveled making it more difficult to travel. Within the Nigliq Channel we had to follow 7 to 11 miles of ice when we went out seal hunting. (Nuiqsut) (MBC AES 2004)

You present the socioeconomic aspects and the connection to subsistence, which they really understand and which I dealt with during my terms as mayor here sometime back. So I think, no question, helicopters, air traffic is the biggest disruption. So it seems almost like a no-brainer to be in support of the road project there and by the way, that spur road for Nuiqsut that Kuupik had been -- their company had been working on was just permitted here a day or two ago. So that's what the community wants and I just want to echo and support their desire to be able to live off the land, considering development is all around them. (Utqiagvik) (BLM 2014b)

Before I would go east of here but there is so much activity going on that I don't hunt that way anymore. Occasionally if I miss one I don't want a stray [bullet] going that way. We are allowed but most people don't hunt up there. (SRB&A Nuiqsut Interview March 2009) (SRB&A 2010b)

While I -- you know, there could be impacts on wildlife through the area. I kind of repeat that the major impact will probably be on people. As you can look at the map, Nuiqsut is nearly completely -- will be completely nearly boxed in with the completion of this project. There's a huge area to the east that they don't use to hunt in any more because of all the development over there. The Alpine development interferes with people going north. The first two satellites that will be put in will only make this worse; it will further interfere with people trying to go to the north and the later developments will kind of block them off to the west. So that doesn't leave them many more options, particularly if there are, you know, more satellite fields out there after these ones are developed. (Nuiqsut) (BLM 2003b)

...it's to look at what happened in Ukudu (ph) Bay in Kuparuk because that is a cumulative impact. The people of Nuiqsut don't use that area like they did in the past. And, you know, there is research that shows that. And what's happened there is going to happen here. So the people who use that area are fearful of that. So that is going to be an impact to all of us. You know, whether industry is very -- you know, you try to do it the right way, people aren't going to want to go hunting there. You might have access or the right to go hunting there but it's not -- you know, it's not going to be a favorable place because you let -- how many people from Nuiqsut want to go back and hunt in Kuparuk with all the pipeline, the roads, or go fishing near Alpine? You know, it's not a preferred place to go. And that's exactly what's going to happen in this area as well as -- the more it moves to the left, it's going to happen. And people are nervous about that, you know? People are. I hear people say, you know, I'm going to go out now before industry comes and enjoy it as much as they can before it comes to our area. So that, you know, I see that as something I want to have on record. (Utqiagvik) (BLM 2004f)

We're getting to go further and further to catch caribou. Because their route has changed. They're not in our backyard. Now I have to go to other communities' backyards, like Anaktuvuk, Atqasuk and Barrow. Caribou you have to go out further because of seismic testing, helicopters, small aircraft. They'll be flying those choppers again. They'll be doing it soon when they gather information like when the ice goes out or when they haul their contractors out. This scares the caribou. What happens when the belt breaks on your snow machine? I walked 10 hours home once. (Nuiqsut active harvester; Experience timeline: since 2001 and ongoing; Experience location: Nuiqsut. SRB&A Interview 2007) (SRB&A 2009)

Yeah, we can't go near the pipeline. You can't shoot near the pipeline. That's restrictive to the hunters. They always warn us not to shoot toward the pipeline or cross under the pipeline. So if the caribou are on the other side, they don't want us to go near it. You have to get permission from Conoco Phillips to go there. (SRB&A Nuiqsut Interview May 2010) (SRB&A 2010b)

Yeah, we can't go near the pipeline. You can't shoot near the pipeline. That's restrictive to the hunters. They always warn us not to shoot toward the pipeline or cross under the pipeline. So if the caribou are on the other side, they don't want us to go near it. You have to get permission from Conoco Phillips to go there. (Nuiqsut) (SRB&A 2011b)

The pipeline. They say we can't hunt near the pipeline; most of the caribou are near the pipeline. We can't hunt with a certain miles of the pipeline. I think it's around here. We went through but they say if we catch caribou in there and get caught they'd give us a fine. (Nuiqsut) (SRB&A 2010b)

If they start making pipelines on land, we have to go twice as far. It's scary. It's an obstacle to us. (Barrow active harvester; Experience timeline: 2006; Experience location: Barrow. SRB&A Interview 2007) (SRB&A 2009)

They're too far out, too far from the rivers. Gotta be lucky [to get them] when they're migrating, but they never came through last year. Now they're over toward Atqasuk. There's none over there. People gone to Umiat and back around. Like I said they were at the dump for months. Traffic, when they start putting in all those ice roads, constantly going back and forth. The roads and stuff scare them off, the congestion and we have to go further to get caribou. Three years ago people were going 75 miles just to get caribou and that's ridiculous. Just the oil companies, the ice roads. I heard that's what's been keeping them away from town. Go back and forth on the ice roads, it's putting a hamper on it. Once the ice road gets built there's equipment and congestion, seems like they go further [the caribou]. (Nuiqsut) (SRB&A 2010b)

Actually, with the Meltwater road on there, the caribou are getting lost. They don't know where the migration route is. We've got the Prudhoe roads over there, but the Meltwater comes farther down, and in the caribou's mind, where's the direction? We used to have the caribou coming into town, the migratory route [used to] come in, but now they don't do that anymore. (Nuiqsut) (SRB&A 2014a)

Although we will benefit for our economics, but we will benefit very little for our subsistence because of the pipeline and because it will up affect the caribou migration, it will displace -- may displace some of the nesting areas of the waterfowl, shoreline birds, that she mentioned from Cape Halkett around the Harrison Bay to Fish Creek and the Colville River delta. (Nuiqsut) (BLM 1998c)

Another area that is no longer accessible is Uulikutuq. Last fall because ARCO made Uulikutuq inaccessible, it took over one week to haul two whales back at Cross Island. That has made things very difficult for us. As a result they were brought back through a big aircraft. Uulikutuq had always been a place where our people left their boats after whaling because of the ice that usually formed making it impossible to return by boat. That is why they left their boats at Uulikutuq. Last fall they did bring their boats back. Where are they going to leave their boats from now on if they are not permitted to use Uulikutuq which had always been used? Right now the way it is, they cannot leave their boats at Uulikutuq. (Nuiqsut) (BLM 1998c)

I've traveled the haul road in the fall time the last three years, and I see more and more outside hunters. When I say outside I mean non-North Slope residents. The caribou seem to be less since that's happening. (Nuiqsut) (SRB&A 2013c)

With the ice road and the diesel, when they make a road, it goes through the land. I know they try to be careful, but the land is ruined. (Barrow active harvester; Experience timeline: since 2000 and ongoing; Experience location: Around Barrow area; Ualiqpaa. SRB&A Interview 2007) (SRB&A 2009)

Within the city of Nuiqsut you see all the activity of Alpine. The caribou migration has really changed over the last two decades. Our subsistence users have to go further for waterfowl and caribou. We've experienced this both on and offshore. Development really affects our wildlife. Our subsistence users have really had to change the last two decades. Much further to go for harvest. (Nuiqsut active harvester; Experience timeline: 1987 and ongoing; Experience location: Nuiqsut. SRB&A Interview 2007) (SRB&A 2009)

And the ice road does. When they melt and all the snow is gone you will see the grass and it is dead and flat. I have no idea why... Probably no oxygen getting to the ground because of the ice... I think it must be from the weight of the ice too. It is heavier than snow and the trucks add pressure to the ground. (Nuiqsut) (SRB&A 2012)

... I think the gravel they have added on the tundra causes early thawing. But it is insulated by the gravel. At some point the gravel can sink and during the summer when it is hotter. She can only talk about Beechey point. She is going to give the young men a chance to talk about these topics. (Nuiqsut) (SRB&A 2012)

3.4.3.4 Contamination*

They can leak and you don't see that until summer. The caribou then eats the moss. You won't know they're sick until you eat them and they taste funny. I tried to go caribou hunting and there was a pipeline. I had to use twice as much gas to go around it. (Barrow active harvester; Experience timeline: 2006; Experience location: Barrow. SRB&A Interview 2007) (SRB&A 2009)

On- and offshore development are different. Onshore there is less chance for contamination because they can control it. We can live with it onshore and work around its effects on our seasonal activities. Offshore it is a hostile environment with moving ice and heavy seasons. It is very risky. If they invade our hunting grounds, that is not acceptable to us because of the risk. (Utqiagvik) (Inc. et al. 2008)

I try not to hunt on Nigliq because a couple of them [caribou] hanging around CD4 have been sick – got pussy lungs and liver. They're abnormal. [Used to hunt near CD4] and every time I made my catch between here and Nigliq it was a sick one. (Nuiqsut) (SRB&A 2015)

Yeah, all of the caribou migrated through there. When I was a young man, I would wait for them there [near Fish Creek] with my uncle. Uncle used to say you go right at that point meaning at Nigliq. Used to be they migrated... even to Teshekpuk Lake. You know the caribou calving grounds, north of Teshekpuk... caribou kind of roam, up to the Brooks Range, up to Wainwright, this is the western herd... This is something else too. My own personal view is it because of the lights from the structures, the oil field infrastructure, and the smell. The smell from Prudhoe Bay, you notice with the haze that comes in. Those caribou have a good sense of smell. (Nuiqsut) (SRB&A 2015)

With the ice road and the diesel. When they make a road, it goes through the land. I know they try to be careful, but the land is ruined. The tundra is affected which affects the wildlife. When I've hunted caribou and am skinning them, I've noticed the meat is yellow. I've had to leave it there. It was due to the mosquitoes or to contamination. Sometimes the mosquitoes are so bad there are nests under the skin of the caribou which turns the meat yellow. (Barrow active harvester; Experience timeline: since 2000 and ongoing; Experience location: Around Barrow area; Ualiqpaa (Walakpa). SRB&A Interview 2007) (SRB&A 2009)

And the only biggest problem I have with that is you have 3 million gallons of gray water you dump on the ground now. And when you look at 3 million gallons of, you know, sewage and dish wash water, and you leave it on the ground, it gets pretty dangerous for the fish. The ground is very flat. We live in a flat ground and all the water that is put on top of the surface goes to the rivers. It works its way to the rivers and to the lakes. When I was young and being taught how to fish by my uncle up at the Chipp River, one time one of us washed our hands in the dish wash basin with soapy water and we went down to the river and rinsed our hands in the river and for 24 hours we never got fish in our nets that day just from rinsing our hands in the river. That's how sensitive that Aanaaklli that we catch, that white fish we eat. And you're looking at dumping 3 million gallons of gray water on the ground? (Utqiagvik) (BLM 2004c)

As you all know we've had pollution that's been identified and that needs to be cleaned up, in part of the NPR-A I here's a rare potential pollution contaminating material that were buried by the Air Force, needs to be considered looking at too, the possibility of me whole Colville, cause of that possible of effecting all of our species, there's been some areas, you probably heard a couple, last year, they had found pretty close to over 30 moose carcasses that were unknown causes of death. And I'm kind of wondering if it's coming from that contaminated site. And these are some of the issues that need to be clarified before the proposed NPR-A lease. (Nuiqsut) (BLM 1997b)

The first cat train in the 1940s, from Barrow to Oliktok, they did not open drums with a bung wrench but with an axe; they pumped what they needed and just left them in the river or lake. That was how they worked when they first came here. (Nuiqsut) (ABR Inc. et al. 2007)

The ice trail they have is only one mile from our cabin and it goes over the river we fish in. That might be an impact for the summer. Lots of trash and traffic. We know which way the trail goes. We see it while we go for caribou. We see more trash on their trail. I've written to the Borough and BLM about it. Their rollagon trail from Barrow. In the summer it leaves marks even though they say it doesn't. After the snow melts you can see where they've been. They say there's no impact, but there is. (Barrow active harvester; Experience timeline: current; Experience location: Ice road from Barrow. SRB&A Interview 2007) (SRB&A 2009)

There are small creeks that tend to develop from an area where there's development. It gets higher, and from that high area, the small creeks tend to go toward the bigger river. And from the bigger river, out into the ocean. And one of the things he's concerned with -- that the water that the animals drink, the caribou and the foxes, the wolves, those that are on land -- if that water is polluted, the effect on the animals would be such that it would affect the lifestyle of the North Slope people. (Utqiagvik) (BLM 1982)

And, this waste material that has accumulated, is quite a bit. We've seen too many caribous that have wires on their antlers. Some of them just die because they just happen to have a couple of them right around their feet our their legs, and a doggone leg drops off. I mean, these are the waste materials that we would like to be protected from as human beings and also for our animals which can not protect themselves. (Utqiagvik) (BLM 1982)

One drum diesel, five gallon motor gas, they were floating down the river. Some changes in the 40s and 50s, there were lots [of changes] from the Navy explorations. Some of the buoys were left behind before they clean up that area. The caribou changed, and everything changed with the caribou. Notice that, I trace changes back to that. That's what I know happened. From Umiat. I think it was 15 years ago [drums floating down the river]. They been cleaning up slowly, but they're still out there. (Nuiqsut) (SRB&A 2010b)

I don't know how many more sites inside the NPRA that you guys have but if you're going to be doing any kind of oil and gas those sites need to be cleaned so that they can be used later because those were original migration routes and this happened what, maybe seventy, seventy years ago, fifty to seventy years ago and they are still not cleaned up. There's still nothing done there. Um, when I traveled out that way maybe 2012, 2013 or 2012 there was a like a rut from barrels that were dumped there. I know that we're not part of the National Petroleum Reserve and we are looking for a water source. We cannot use these. This being one that we have because it had old metal and stuff dumped into it. I know that our waterways run all the way into this reserve and so Lapita is right. We need to be able to have these lakes open and protected for the water source. (Point Lay) (BLM 2019b)

In a sense, they feel like the oil companies are coming freely without rules or regulations guiding them, in a sense. These are things that were happening in state lands and one of the things that they saw the change in the environment was the development when they started going up toward Umiat to do their hunting in the summer and the fall time, they noticed that there was a lot of drums along the shoreline of the river that were floating down and sometimes, if they -- they found drums of fuel, diesel, white gas, gallons of -- one gallon and five gallons and this wasn't happening in just one season. It was a lot of things that were floating down and they think it was from Umiat because they started falling into the river from the oil -- whatever they did back in Umiat and I think they did a lot of things within that area. (Nuiqsut) (BLM 2014c)

Bilge water, that's a concern. We're totally against [drilling fluids]. Deck drainages, we're not that concerned about that. Blowout preventer fluid. When they were doing the Louisiana thing, it was a mud that thickened. All of this is alien to the area. I've heard horror stories about bilge water because it has other life in it. (Point Lay) (SRB&A 2011a)

That's going to be a massive problem, what they're putting back in the water after it's treated. Chlorine and caustic soda. They say it won't affect the water, but they don't know that. It removes the oxygen. What it does it kills the oxygen in the water, in the bottom. (Point Lay) (SRB&A 2011a)

If they're discharging, then let them look around first. There's always ugruks and seals that are curious and pop up to see what you're doing. A couple of ugruks keep popping up around us down at Omalik just to see what we're up to. We had four of them come up right next to the boat. I heard breathing and they went down. (Point Lay) (SRB&A 2011a)

Through krill and other small species, then to work their way up to larger species over time. Well the main thing I'm worried about is the krill and the small species. I'm not sure if that mud is going to be killing them off or poisoning them. Maybe they'll start feeding on the small particles on the mud that's being discharged. (Point Lay) (SRB&A 2011a)

We will have meetings and it doesn't change anything. Like at Umiat, they assumed 40 years ago that what we didn't know wouldn't hurt us but now it is all spilling out of the ground. (Nuiqsut) (SRB&A 2012)

It's just something we don't want to risk chancing losing. It's the lifestyle, the circle of life, you know. It's the stuff that they can spill in our water that will affect one animal and it's going to affect the other animal. And that's going to die off. Look, we are our own people. Without those animals, who are we going to be? (Point Lay) (Mikow et al. 2016)

I do not like it: that is the way I feel... They're coming into my backyard, and this is a very fragile ecosystem, and we hope we get a lot of migration, animals migrating from pretty much all over the world. They come up to go eat and reproduce in this ecosystem, and once oil starts coming in, it certainly would pretty much kill off all the krill. And that is probably one of the best areas to eat before they go back out. I think they eat a lot of krill to get fat and make their way back. We get all kinds of animals, birds, mammals, fish. (Wainwright) (Mikow et al. 2016)

3.4.3.5 Non-Oil and Gas Impacts

Fish and Game regulations don't help us. Moose season is too late so we can't get our boats upriver before freezeup. Guides and sport hunters from Fairbanks can fly in and get the moose we need for meat, especially now that we can't get enough caribou. (Nuiqsut) (Brown 1979)

Once in a while we get these private planes or...other people from the other major hubs flying up here and taking the scenery route, doing something, taking pictures I guess. Those ones we can't stop. They don't get out, because they're, they're just somebody who owns their own Cub and just go take a joy ride up here. But we try to tell the airlines and everybody in North Slope Borough to help us printing those ads, just like to the airplanes or the helicopters. They need to start honoring that no fly zone. (Point Lay) (Braem et al. 2017)

[There is] less of a migration every year, because of those guide folks over there. I think there are two or three guide folks, and they are starting to [hunt] over toward the Galbraith [Lake] area, and sometimes [they go] to Shainin Lake with float planes. So if the caribou are coming from the pipeline area, as soon as they come down the hill they shoot them, and send [the second group] over in another direction. A few might come [toward the village], but most end up in the western area. Some [caribou] might [make it to the village], but there are less than eight years ago when we had assistance from Wainwright and Nuiqsut. The North Slope Borough chartered an airplane to get caribou down here; we had maybe 30 caribou for the whole community. Some years it gets to be that way.... Sometimes it would be super smoky, you can't see the mountains, and it plugs up the area. When [the smoke] gets just above the mountains caribou don't like [it]; I don't blame it all on guide folks. When there's forest fire smoke [the caribou] go [somewhere else]. It's always been smoky here. (Anaktuvuk Pass) (SRB&A 2013c)

Sportshunters. As a hunter we're already there to harvest game. Caribou may be coming toward us, and helicopters or small planes with sport hunters fly in and divert the caribou from their normal routes. They use our cabins; help themselves; then they hunt the caribou and don't take the meat or the skin - only the trophy rack they want. It's going to have an impact over time if they keep it up. If they were limited to maybe 10 a year (now they're taking 40 to 50 [total] caribou a year) it would be devastating! I provide for a lot of families, elders and widows, etc. Since the state allowed sport hunting we're fighting for our rights. We need bag limits to keep below the harvest threshold. We need to set a certain limit -- do drawings on caribou hunts like they do on bears. With sports hunters it's an attitude of have at it -- sport hunters don't have to deal with our extreme environment and over harvest resources we've preserved for thousands of years. (Barrow active harvester; Experience timeline: 1997 and ongoing; Experience location: Hunting areas on the North Slope. SRB&A Interview 2007) (SRB&A 2009)

You know, that's— but that Haul Road is open to public, so there's so much hunters over there. Now the caribou herd comes straight from over there and I don't see them. Like Porcupine Herd that used to cross, now they make separate herd, Western Herd. We depend on Western Herd and Central Herd through fall time. Western Herd we depend on, but I heard they are decreasing now. 400,000 to 200,000. We are not the only hunters. There are so many hunters to the north of us. It is open to the public. But we can't control it anyway. But we do depend on the fall caribou herds. They used to come right through our valleys. I

hardly see them anymore. Now they go 30 miles west of us, maybe same distance on pipeline over there. Anyway, I wanted to bring that up. I subsisted hunt all my life. We still depend on caribou herds, but when I say that, it also—airlines, there is no road here, only airlines come through here. So everything comes through the air. Very expensive. I save too much time at meetings... If you had to pay, that's what I witness. I have to pay \$10 or more a gallon for gas, \$21 for a quart of oil. Some young people or some people don't have a job. They can't afford it. White gas, \$11-\$15 a gallon. People don't have no job. It is hard for them. You know, I just want to bring that up. I witness that. (Anaktuvuk Pass) (BLM 2018a)

Sportshunters. As a hunter we're already there to harvest game. Caribou may be coming toward us, and helicopters or small planes with sport hunters fly in and divert the caribou from their normal routes. They use our cabins; help themselves; then they hunt the caribou and don't take the meat or the skin - only the trophy rack they want. It's going to have an impact over time if they keep it up. If they were limited to maybe 10 a year (now they're taking 40 to 50 [total] caribou a year) it would be devastating! I provide for a lot of families, elders and widows, etc. Since the state allowed sport hunting we're fighting for our rights. We need bag limits to keep below the harvest threshold. We need to set a certain limit -- do drawings on caribou hunts like they do on bears. With sports hunters it's an attitude of "have at it" -- sport hunters don't have to deal with our extreme environment and over harvest resources we've preserved for thousands of years. (Barrow active harvester; Experience timeline: 1997 and ongoing; Experience location: Hunting areas on the North Slope. SRB&A Interview 2007) (SRB&A 2009)

What I've noticed over the years, you know, we were taught by our elders to let the first herd go, the first bunch needs to go to make the path. Nowadays, once they hear about caribou, boats go out and they shoot whatever comes through. So we're kind of losing our -- what our elders have taught us to do. Some of our young hunters aren't allowing the herds to go through like they're supposed to and we can't force them. We can only tell them. (Nuiqsut) (BLM 2014c)

[I noticed] campers out there – other people, not local. Most people seen them with their loud jet boats and stuff. It was upriver somewhere, past Ocean Point, by Chandler. Like, I don't know how many miles, but somewhere around there, because when we were camping they were right there. Lot of noise, you could see caribou out there scouting on the hills, so they could hear the noise. The jet motor was loud as heck, definitely scared like three caribous away. (Nuiqsut) (SRB&A 2014a)

[There are] more activities. Planes [travel]back and forth [in the] springtime and summertime. That's when the people are hunting from the plane. [They come] from [the] Bettles area. [There is an] airstrip about 25 miles [away] and [people illegally] catch [caribou] down [near] Bettles. I called down Bettles and said "watch out for that plane, it's got [illegally caught] caribou". [There are] more guide hunters down there now, about 15, 20 miles towards Galbraith[Lake]. It's a long time [that they've been doing it]. They gave them permission to do it down there. We hate them though. They give out permits to make money. What do we get? Nothing. (Anaktuvuk Pass) (SRB&A Unpublished)

3.4.3.6 Legal or Regulatory Barriers

My concern is stray bullets. When I'm out subsistence hunting, I'm used to having a 50 mile area to myself. If there are 10 to 15 people in that area, that is crowded. I don't want to accidentally shoot someone. What if there are people on the other side of the hill and I don't see them? (Barrow active harvester; Experience timeline: 1990s; Experience location: Chipp River area. SRB&A Interview 2007) (SRB&A 2009)

Winter time we'd go toward the west side, because the caribou are coming in from the west, so over by Fish Creek. We'd be on the west side. All the way back to Fish Creek. The caribou come in from the west. The caribous are coming west from the coast to here and out in the Fish Creek, CD5 area. Caribou hunting in this area is tough, because most of these areas [north and west] are closed. You have to have a permit to go on CD4, Alpine area, so we go more on the west side. [We start hunting by snowmachine] winter time, somewhere around November. (Nuiqsut) (SRB&A 2016)

In addition, despite the relatively benign impact of the TAPS itself, there have been negative impacts that are not associated with TAPS operations along the Right of Way such as stressed public services and sport hunting pressure. The Borough is saddled with some of the TAPS corridor public services and the Mayor went into great length in describing these. Providing these services in a remote area that is devoid of permanent Borough residents is costly and difficult in times of shrinking Borough revenues. And when it succeeds in delivering these services, it seems only that it increases the influx of outside visitors traveling along the Haul Road who need even more support. So this is an undesirable feedback, effect, the more support we give to the Haul Road corridor, the more people use it, the more people who use it the more support they need. In addition, some visitors use the Dalton Highway and the associated airstrips to exert sportshunting pressure and produce other negative impacts that are not associated with TAPS operations. (Utqiaġvik) (BLM 2002)

We were able to hunt where the pipelines are and stuff. But now it's all built around there and our hunting lands is being diminished because of the pipeline then the oil field productions that are being up. And now I can't even go hunting over there 'cause I don't want to get in trouble for hunting near pipelines or where people are working. And even though there's caribou or animals around there, which I know I can go get, I don't go around those areas. (Nuiqsut) (Brown et al. 2016)

Beyond the dangers associated with the Haul Road travel are impacts to subsistence can be linked to that highway. While by comparison under normal operating conditions, the pipeline's impact are somewhat constant and manageable. The impacts of the Haul Road are largely dependent on traffic levels. More traffic generally means more impact on wildlife and to the North Slope residents. Since the opening of the Haul Road to the public subsistence hunters in Anaktuvuk Pass and Nuiqsut have noticed a decrease in the availability of caribou near their villages. Sport hunters and game guides using aircraft and off road vehicles cache supplies and use the road as a jumping off point to reach vast areas of the North Slope traditionally utilized only for subsistence by these and other communities. Competition for resources, disruption of subsistence activities and non-subsistence hunting practices which deflect animals from traditional subsistence harvest areas are a major concern. Without mitigation, these impacts will sure increase with the increasing traffic on that road. This is a very serious concern for those residents and more focus should be placed on scientific study and mitigation measures to address the village concerns. The village concerns of Nuiqsut and Anaktuvuk Pass. (Utqiaġvik) (BLM 2002)

Another big concern I have about any of the Plans is, if you build an industrial road within NPR-A, people are going to find a way to use it. You look at the Dalton Highway; when that was first built that was an industrial road and it was only going to be used for industrial purposes. Today it's a public road. And we have issues there where people -- we have competition for resources: sport hunters, recreational people, tourism, all that stuff is happening. And they want to even make it more accessible for people to hunt from that road. And if you build a road into NPR-A, people are going to come. Whether they say it's an NPR-A -- or an industrial- only, it's going to change. I just know it is because that's what happened in the past with the Dalton Highway. (Utqiaġvik) (BLM 2004a)

Yeah right now it is difficult to go to Alpine because they have a buffer zone in that area where we can't enter within two miles of buffer zone and that impact the hunters too. Most of the time they used to be a lot of caribou towards Alpine but that has changed a lot. Too many [regulations]. (Nuiqsut) (SRB&A 2014a)

3.4.3.7 Safety/Security Concerns

Yes, [ice road activity] affects me. It makes me nervous at the same time. I don't like to shoot my rifle towards this. There's an ice road southwest toward CD5; that makes me nervous. I know there's traffic out there. I don't like to shoot my rifle toward southwest and even if I try to shoot that caribou, pointing my rifle toward southwest there's traffic, caribous, tracks, rolligons, you name it, it's out there. That scares me, makes me nervous. I always thinking about shooting my rifle northeast because there's less traffic. More traffic going southwest. On facing southwest there's more traffic. That make me nervous, super. There's people out there just traveling. They're walking sometimes, doing seismic. October,

November, December. Rolligon, cat train. I look with my binoculars and see people walking. (SRB&A Nuiqsut Interview March 2009) (SRB&A 2010b)

And a lot of caribou this year was towards the Alpine side so I couldn't shoot or anything because the drill rigs and the pipeline there were very few on this side....I just don't shoot towards the pipeline. I'm not taking that kind of risk. (Nuiqsut) (SRB&A 2010b)

We don't go down that way to caribou hunt because of the pipeline in there; it is a big obstruction. A lot of times they [caribou] are on the pipeline side and we don't shoot. They [industry] tell us it is OK to shoot, but common sense says not to shoot into pipeline! (S.R. Braund and Assocs., 2003, Field Interviews, USDOI, BLM, 2004) (Nuiqsut) (MMS 2007a)

Yeah right now it is difficult to go to Alpine because they have a buffer zone in that area where we can't enter within two miles of buffer zone and that impact the hunters too. Most of the time they used to be a lot of caribou towards Alpine but that has changed a lot. Too many [regulations]. (Nuiqsut) (SRB&A 2014a)

We get these fliers in the mail about Alpine safety and it talks about using firearms around pipelines and all that other stuff. ConocoPhillips is always stressing that, so it kind of scares us off a little bit. I don't go over there [toward Alpine]. (Nuiqsut) (SRB&A 2014a)

My concern is stray bullets. When I'm out subsistence hunting, I'm used to having a 50 mile area to myself. If there are 10 to 15 people in that area, that is crowded. I don't want to accidentally shoot someone. What if there are people on the other side of the hill and I don't see them? (Barrow active harvester; Experience timeline: 1990s; Experience location: Chipp River area. SRB&A Interview 2007) (SRB&A 2009)

Yeah, we can't go near the pipeline. You can't shoot near the pipeline. That's restrictive to the hunters. They always warn us not to shoot toward the pipeline or cross under the pipeline. So if the caribou are on the other side, they don't want us to go near it. You have to get permission from Conoco Phillips to go there. (SRB&A Nuiqsut Interview May 2010) (SRB&A 2010a)

Yes, [ice road activity] affects me. It makes me nervous at the same time. I don't like to shoot my rifle towards this. There's an ice road southwest toward CD5; that makes me nervous. I know there's traffic out there. I don't like to shoot my rifle toward southwest and even if I try to shoot that caribou, pointing my rifle toward southwest there's traffic, caribous, tracks, rolligons, you name it, it's out there. That scares me, makes me nervous. I always thinking about shooting my rifle northeast because there's less traffic. More traffic going southwest. On facing southwest there's more traffic. That make me nervous, super. There's people out there just traveling. They're walking sometimes, doing seismic. October, November, December. Rolligon, cat train. I look with my binoculars and see people walking. (Nuiqsut) (SRB&A 2010b)

3.4.3.8 General Resource Availability

And hearing that this impact is going to be more and more and more each year and each time is telling me I have to try 100% more harder to get food on my table. And I just keep wondering, how am I going to survive if these animals are being impacted? What is it going to take for me to make a supper? What is it going to take to find something to eat? And the animals that I depend on are being impacted and these are things that I depend on daily. And I just want you guys to know that subsistence is a big thing in my life and that's what I depend on each day to survive. (Nuiqsut) (BLM 1998c)

Go out further to get caribou. Gas costs more, when we first got here, we could walk across the river and get caribou. In summer we used to get lots, now only ones that come in are from the West side. (Nuiqsut active harvester; Experience timeline: Since 1998 and ongoing; Experience location: Nuiqsut. SRB&A Interview 2007) (SRB&A 2009)

So I have lived there and I'd like to know -- this is about the hunting area or fishing around Nuiqsut, especially on Fish Creek area. There's a lot of fish out there, especially Nuiqsut residents had used that for subsistence for more than thousands of years. Also around the east portion on this land where the Arctic ciscos are coming in through all the creeks over here. I fished with my mother for -- ever since I was a little boy. So there's hardly any Arctic cisco nowadays that used to be like 30 years ago. So ever since all this activity start happening around Alpine, the Nuiqsut have been impacted so much, by 100 percent, because all the birds that are around this area, they're nesting all over because I had experienced that before. I used to get a lot of Arctic cisco when I lived -- was a little kid with my mother, by hundreds and hundreds, and right now what my mother have been telling me, there's hardly any Arctic cisco nowadays ever since the Alpine has started about a few years ago. (Nuiqsut) (BLM 2003b)

We have to protect all of the moose as well. There's a lot of moose that come in and out of the National Petroleum Reserve all over and we're starting to see change in patterns of migrations and birds and in caribou and in moose. We've seen owls that never came this way, now they are migrating this way more and more and I know some of that might be due to the fire that they had down in the Brooks Range on the other side but we know that our animals are always coming this way for protection, same with your muskrat and our large squirrels. Our (Chikshukpuk? 37:24.19) is what we call them. They are starting to move and change their routes where they usually be. They are starting to spread out. Where people used to never see them now, they are seeing them. So, any, any of those, any of our subsistence resource that we go off of I believe that they need to watch out for in the migration pattern of those species. (Point Lay) (BLM 2019d)

The caribou herds used to migrate through our village and now they migrate away from us. Last summer only three houses hung caribou. There are over 100 houses and most houses went hunting last summer. The offshore developments have caused problems with our fish. They are not coming. It's been eight years now. I know one family that hunted all summer, 80 days, and not one caribou. Where is the help for us when we go without? (Nuiqsut) (BLM 2003b)

3.4.4 Sociocultural Systems

3.4.4.1 Social Issues and Change Resulting from Development

Right after the oil boom. This is when I noticed the change. When I grew up people might have a drink or two, but not get drunk. Now we hear about meth, cocaine, and the small villages first. Our Barrow is the hub, then it spreads to the little villages. (Wainwright active harvester; Experience timeline: since 1972 and ongoing; Experience location: Barrow and North Slope villages. SRB&A Interview 2007) (SRB&A 2009)

I think about it a lot. I teach our history and when you understand what's happened in our past and what's happening today, it's cause for wonder. Socioeconomically, we've gone from a barter society to a borough that has been able to tax industry, until recently, when the life of the industry [has] now degenerated. It's had a lot of economic implications. When we go back to a traditional social framework that we loved 60 years ago, there's an increasing concern with dependence on government welfare. There's a lot of social implications associated with development that have been neglected. We've spent a lot of time, a lot of resources finding out what's been going on with the caribou, the whales, but not with what's been going on with our people. (Barrow active harvester; Experience timeline: 1945 and ongoing; Experience location: Barrow and all over the North Slope. SRB&A Interview 2007) (SRB&A 2009)

We have also spoken before about another less obvious category of impacts, these are the social and the cultural impacts associated with North Slope oil and gas activities that continue to affect our communities. They are not always specific to a single project or incidents, but can certainly be heightened by individual events. More continuously, these impacts reflect the cumulative level of industrialization that makes people worry and feel threatened by the effects of change. Over a relatively short three decade period of time our people have experienced changes, felt over perhaps 200 years by the greater American society. Despite the clear benefits with oil and gas development on the North Slope has generated,

industrialization has also created the conditions for a whole range of anti-social responses to a deeply felt sense of loss. The stress and anxiety and the depression associated with dramatic change is evident in individuals, in families, and in the broader North Slope communities. George Ahmaogak, Sr. (Utqiagvik) (BLM 2002)

Not long after that, we had another bad season when one of our whaling captains was killed. We sent supplies to Prudhoe Bay because if you do not bring it to the island, you go without. When the captain went to pick them up, the weather turned bad. The captain was lost after a conflict with the manager at the camp there did not know about our lifestyle and us. The whalers were unwelcome at the camp and tried to return to the island, but they struck an iceberg and took on water. They called for help and they came with a helicopter to rescue them, but that captain was lost. The helicopter was not designed for the rescue. All the whalers came back to bury their fellow captain. The weather did not allow them to return to finish the season. Both seasons caused us to lose out on subsistence resources. The people were hurting. They had no jobs and they had no food in the ice cellars. They were suffering as seismic activity continued around our land and resources had gone with them. No alternatives; no income to buy from the store. I saw the effects of alcohol or drug abuse, domestic violence, suicide attempts and successes, conflict amongst the people with only a few jobs and every house had bills, but many houses had only one member working and most were seasonal short-term jobs. When the sun goes down in the north, the subsistence resources go with it. They may take many months to come back. The people suffered waiting for the sun to return and the subsistence resources with it. Some lost hope and they could not wait. (Nuiqsut) (BLM 2003b)

I guess I would have to say the urbanization of the Arctic. By that I mean, proliferation of roads, loss of language, TV worries me a lot. I've seen a huge change in community activities. Nobody walks; people are staying at home. The wildlife impact is more nebulous; my greatest concern is the impact to people. For example: When [I was] mushing from Barrow to Nuiqsut, I encountered a seismic crew on Teshekpuk Lake and they freaked out and said we had to divert 10 miles. That was a wake-up call. (Barrow active harvester; Experience timeline: 1993; Experience location: Teshekpuk Lake. SRB&A Interview 2007) (SRB&A 2009)

The communities are pretty much like a big family. When there's not much subsistence, when there are young men who can't go out with others, it affects them. They socialize the wrong way. (Barrow active harvester; Experience timeline: ongoing; Experience location: Barrow and other North Slope communities. SRB&A Interview 2007) (SRB&A 2009)

They're not here yet, but when they [oil companies] do [come], it'll be like Nuiqsut. There'll be roads to bigger cities. Then the wrong kind of things will come in like drugs and alcohol. It's starting now, even though we're not impacted. Once something gets started in town, we'll need more public safety officers. We used to get by with people hired by the city. Now we need training by public safety officers. (Wainwright active harvester. SRB&A Interview 2007) (SRB&A 2009)

With tourists videotaping us every time we go out. With the ice so close nowadays, I mean like three-quarters of a mile out with all that global warming or whatever. Now we're right off shore and they walk out there and videotape us. I don't like that. What if they twist it around and make us look like bad people? (Barrow active harvester; Experience timeline: 1978 and ongoing; Experience location: Barrow. SRB&A Interview 2007) (SRB&A 2009)

My son's first harvest impacted by change, the loss of sharing that harvest within the family and the community, the joy of sharing a meal within the community, the joy of being recognized by the elders of our community. Those are losses that occur to our families. And these are things that are occurring on a daily basis. Rosemary Ahtunagaruk. (Nuiqsut) (MMS 2009b)

You see it. When there is an influx of money locally, there is rising consumption of alcohol and drugs. Where there is development, gold rush in Fairbanks, just like Nuiqsut, alcohol and drugs are readily available in the bigger picture of things. Who will be the people in power to solve [the problems]? Who

will bend more backwards to oil development or subsistence? If there's lots of money, drugs and alcohol follow behind. Whether there is a conspiracy to bring in drugs and get them drunk up, who knows? That's in the back of my mind. How come it's so easy for drugs and alcohol to come in? Big money means drugs and alcohol. (Barrow active harvester; Experience timeline: since 1971 and ongoing; Experience location: Villages, Barrow, Nuiqsut. SRB&A Interview 2007) (SRB&A 2009)

Drugs and alcohol, that's the worst part of it. It's expensive; \$300 for a quart [of alcohol]. They made money bootlegging. When the pipeline started I guess, everything came from there. (Anaktuvuk Pass) (SRB&A Unpublished)

We were living in Bethel. We moved back to Wainwright. This is when I noticed problems. When there was lots of construction [and] we began to see drugs and alcohol abuse. The NSB has grants for suicide and drug abuse [treatment], but you have to be a real bad guy to get help. Lots of our young people do not know how to deal with these problems. Since the 1980s people have started showing disrespect. That's alcohol abuse. If we stay strong to our Iñupiat values. I do not want drugs and alcohol to overrun us. Our young people have to deal with peer pressure. The in-crowd. Listen to your heart, like I was raised. You may become a loner, but deal with it. We do not have professionals to deal with our problems. (Wainwright active harvester; Experience timeline: ongoing; Experience location: Wainwright. SRB&A Interview 2007) (SRB&A 2009)

The staging and mobilization for ice road building, the housing of drilling and construction crews in Nuiqsut, and general oil development and exploration creates multiple interrelated and cumulative impacts to our community. These impacts include more trucks on the community streets and more planes landing and taking off at the airport, pressure on the community's water and sewer systems, landfill, fuel storage capacities, and local clinic. The demand on the local services will increase as the five proposed satellite projects take place. Additionally, the supporting documentation for Alpine Satellite Development Program, production and project description, September 2002, mentions a very real possibility of ten future satellite projects within 30 miles of Alpine. The community disruption from oil and gas exploration and development leads to sociocultural impacts in the areas of our health, economic well-being, recreational activities, and the social and cultural structure of our community which deserves mitigating measures. (Nuiqsut) (BLM 2003b)

I've noticed a lot of people who have worked for Prudhoe Bay or in the oil fields have moved to Fairbanks or Anchorage. It's easier for them to transit. Easier for them to spend their money. The ones who go to college get job offers to work in Anchorage. I'm afraid they will not come back. We have a brain drain. (Barrow active harvester; Experience timeline: since 1995 and ongoing; Experience location: North Slope. SRB&A Interview 2007) (SRB&A 2009)

Younger generations are leaving: They have no chance of making it, to build their own house and raise a family because costs are so high [here]. Anchorage is the place they are moving because it costs less. There is no way in hell I can live in Anchorage. I can take it about 10 days at the most. It's too fast paced. Younger kids won't really make it here. (Barrow active harvester; Experience timeline: beginning in 2000 and ongoing; Experience location: Barrow. SRB&A Interview 2007) (SRB&A 2009)

We're losing the younger generation and the traditional ways. The oil company jobs are good, but it takes them away from traditional ways. (Atqasuk active harvester; Experience timeline: 2004-2005; Experience location: Atqasuk. SRB&A Interview 2007) (SRB&A 2009)

The ills of alcohol and drugs. It comes into Nuiqsut through the Haul Road and through Alpine. It will hurt us even more if they build a road and start driving in. (Wainwright active harvester; Experience timeline: since 2005 and ongoing; Experience location: Nuiqsut. SRB&A Interview 2007) (SRB&A 2009)

My only concern is the impact of people that are going to be coming again. Not only will this public route be more impact for our situation, I think it's going to create more impact. I don't know that, but we will see. We know what the impacts are, socially it has had a great impact. Not only do we have a different outlook, but other things were created and we have to deal with it. You know, more drugs will probably

be on the road. Use to be it was just alcohol, but not anymore. The drugs are light and not visible. I think that will create more problems in the long run. That's me observing. We've had the impact of animals, we say, the stopping of the porcupine herd, we don't see them ever. We only deal with the Teshekpuk herd, and occasionally the western herd, we get that, but not always. The one we are really concerned [about] is the Teshekpuk. It will be a real big impact if they are stopped. Like I said, at Nuiqsut you could see three oil rigs right from the village. Three oil rigs and one blew up about a month ago and people were sick for about a week. I don't know if we want that for ourselves. They were sick for a whole week. Whenever the wind blew from the north they got the fumes, maybe it reached us here, I don't know. It's natural gas, maybe we should worry about that. (Anaktuvuk Pass) (SRB&A Unpublished)

in 1973... when we first got here in 1973 social and economic was different we never experienced anything like that. Since Prudhoe Bay started expanding westward we see a lot of changes today. The changes have to do with the environment but it has also changed the pattern of the animals and the vegetation. To socio-economics has impacted the village. By the time they got to Colville Delta... we never had any social problems or economic problems when we got here in the early 70s but today we are experiencing lots of impacts from development gradually coming westward acre by acre and soon they are here and they are right there and we don't know how it will affect us when they open the west one. (Nuiqsut) (SRB&A 2012)

My grandparents would talk about displacement, hunting routes, campsites and things. I was heavily involved with Alpine as cultural Guardian for the city. Before that the Borough gave our permits and ASRC and the State did the same to the companies without talking to the village. They didn't even consider coming to a place like Nuiqsut until we changed it. Now it's a requirement. I know for a fact that since then and along the way the North Slope Borough had to change the ordinances and plan for that. (Nuiqsut) (SRB&A 2012)

There is a lot of anger in the community because of the pipeline. (Nuiqsut) (SRB&A 2012)

It is hard to compare, back then [when TAPS first came] they had cocaine, alcohol and marijuana. There are a ton of other things now including methamphetamines. I have had to take care of friends that were one it. It is not a good drug to get into. I smoke marijuana, but that's natural stuff and I don't have a problem with it. It's not like it was made with chemicals in the bathroom. (Nuiqsut) (SRB&A 2012)

It just got worse [as development increased]. When they first started [building the pipeline] it [the drug and alcohol problem] was ok but after the pipeline started working it just got worse and worse. These people are ok when they are sober but later on like sometimes like a year or so everything turns around and they go to alcohol instead of trying to get away from it. That is what they done so... it has been up ever since. There is no way of stopping it. (Nuiqsut) (SRB&A 2012)

when we first got here in 1973 people all pulled together happiness as here there was no alcohol. There were times when we had lots of activities going on when we were a tent city. We all worked together. We didn't worry about alcohol. People were subsistence and living together, working together. We had outdoor sports and people gathered together and had activities. It was going on for quite some time until one day all of this illegal stuff came in and the happiness was going down. We were rising and the happiness was on top and gradually it was going down. All of those activities that we used to have are not there anymore. We have no evening or weekend activities with our people. We don't have something to show to our younger generations or grandchildren. (Nuiqsut) (SRB&A 2012)

There is a big increase in the people using the area. There isn't a lot of housing around here and when one comes on the market it is too expensive for the local people, but the industry can afford it so they buy them and change them into offices. It bothers me a lot. (Nuiqsut) (SRB&A 2012)

There are big families all crowded into one house. There will be multiple families. They have money; they should just build their own buildings (the industry). (Nuiqsut) (SRB&A 2012)

3.4.4.2 Social Organization

Prudhoe Bay has drastically changed the political atmosphere of Barrow. Back when they were exploring, there was not political impact. The Inupiat pretty well had the governing, had the last say on political activities. But when oil was discovered in Prudhoe Bay, then everything changed in the governing scope in a short period of time. And everything that has materialized today is because of oil in Prudhoe Bay. The Prudhoe Bay area was a haven for hunting in the past. Since the oil industry has become active, the traditional hunting grounds have not been available to the Inupiat people. This is the most impact it has had on our cooperative sharing. Jonah Leavitt. (Utqiaġvik) (Worl and Smythe 1986)

When they first started moving from Barrow, one of the things that a lot of the old people, and we heard this story before, but I'm going to retell it, that the elders that had moved away from there wanting to go back, back to their homelands because we remember that they told them that if the children didn't come - take them to Barrow for education, that they would take them away. That's one of the reasons why all the people that lived down in this area went to Barrow back in the 1940's, 1930's, somewhere in there when a school started in Barrow and then when the Native Claims Settlement Act started, they started their -- a lot of the elders that were taken -- to be home, wanting to go back home because they felt like this is their land and they don't want to lose their land and that's why Nuiqsut was restarted for the people that are wanting to go home and that -- those were the years that they stayed in tents for a year or many years.. and there was plenty of animals when they first moved because hardly -- the oil companies hadn't gone this far west and they were mostly out on the Prudhoe Bay area and there was a lot of caribou and the fish were fat in the Colville River. Then when we're talking about this -- the elders that have lived the subsistence way of life and not depended on store-bought food, they always prefer subsistence food, like the caribou, the fat caribou (speaking Inupiaq) that were available around here and things have changed and she talked about the glass - another thing that came from the gravel pit preparing for expansion of the industry and it was interruptions like then with the industry coming closer to Nuiqsut and now, come closer, they're catching fewer caribou. For her family, 10 caribou is good for the winter, but they couldn't catch any when they were flying planes all the time. They only got about two this year. When they (indiscernible)look back when the industry was getting closer and there were a lot of meetings like these, well, in a sense, not going to those meetings might have caused a lot of things to happen. (Nuiqsut) (BLM 2014d, c)

3.4.4.3 Mixed Cash/Subsistence Economy

Impact mitigation funds from Pioneer and Conoco Phillips. That helps because if the helicopters scare our caribou further from here, like to Fish Creek, then that helps to go out there. We can get fuel vouchers from that impact fund, and once or twice a year they will give out a small check to the household, but you have to be an active subsistence household, not just any household; like the elders aren't active, but they have people hunt for them. (Nuiqsut) (SRB&A 2010b)

Subsistence lifestyle is priceless. There is no price to it, period. It's our livelihood, part of our culture. That has been passed on to us for thousands of years. (Nuiqsut) (BOEM 2011)

Having to adapt to a cash economy. Living in a capitalist world, you can't live without income. I've seen this more over the last 23 years. You hardly see anyone camped out all season like the summer gathering time like you used to when I was growing up. The whole family would spend the time out there. Making seal oil, drying meat, preparing for winter. Now most folks spend two weeks or a month at the most. We've had to find more full time jobs with less time to hunt. It's a gradual change. I guess it's normal for any society. (Barrow active harvester; Experience timeline: 1982 and ongoing; Experience location: North Slope. SRB&A Interview 2007) (SRB&A 2009)

The gas prices are what really get us, we have to wait to get a paycheck. Some people would rather use their boat and wait for a later time, and us we don't own a boat, so we borrow one or go with somebody. (Nuiqsut) (SRB&A 2015)

It's just, the cost of living, high cost of gas, high cost of ammo, high cost of maintaining your snowmachine or boat...and it adds up...So, you spend \$3- to \$4,000 on grub, gas, and whatnot to go out for 10 days or 2 weeks to harvest caribou before the long winters and yet, you know, there's no caribou. You come home empty. Sometimes you just get a couple due to a lot of activities happening up here. (Utqiagvik) (Brown et al. 2016)

It costs more to do subsistence activities now than in the past. So, in that regard, for an adequate comfort level to cover your costs, you work longer and take shorter time with your families. (Barrow active harvester; Experience timeline: 1995 and ongoing; Experience location: Barrow area. SRB&A Interview 2007) (SRB&A 2009)

The way I hunt now is much different. I need a snowmachine, four-wheeler, outboard. I used to need a dog sled and boat with a sail. If you don't have these things, you have to buy meat from your neighbor. Now hunters are more independent with fewer helpers. I used to take out five to nine people. Families and hunters are trying to be independent. You rarely see people out unless they are related to the boat owner. Wainwright and Pt. Lay are very lucky. Oil development is not here yet. Like Nuiqsut and Barrow, we've had meetings with oil companies. They're coming on our land and ocean. They did seismic testing last year. I did not see much effect on ugruk, but I did not see any beluga. (Wainwright active harvester; Experience timeline: 1954 and ongoing; Experience location: Wainwright, Pt. Lay. SRB&A Interview 2007) (SRB&A 2009)

These are some of the diets, our customary diet that we depend on, not just whales, but whales are one of the main species that we really depend on, and it's been known over 10,000 years, known that we have been whaling. It's been passed down from generation to generation. My brothers and I came from a big whaling family. As a matter of fact, came from a real subsistence economic. Our parents are gone now. Had raised 12 -- 12 children with no cash economic. It's been all subsistence, living off the land, living off the sea. And we are -- and they are gone now. And now it's our responsibility to continue keeping the tradition alive, and we are passing it on to our kids. That's how the chain -- the chain of -- the chain link occurs. When we are gone, they will still be here, even when the oil is gone, been extracted out. (Nuiqsut) (BOEM 2011)

There are people with no job, there are people that are with jobs, and it's just hard for people, you know people think of their families, of themselves, but they have their family take care of them. People that are working aren't there to fish and it just work both ways you could say. I'm a fisherman that goes out there and whenever I get the chance to go out there and fish, and I give it to people—to whoever needs. (Point Lay) (Braem et al. 2017)

Our subsistence is food on our table; if we start having to pay for licenses like it's starting to happen, then we'll need more money. I don't think it's right for somebody out of state to tell us that you need to have a license to hunt where you were before we were even born. I don't think it's fair for them to say that if you break that law, you'll be put in jail. We want our kids to have the freedom that we had. It seems like our freedom is being limited and we can't go back to what we had. Fuel is so expensive and you need a lot to do the hunting you need to do. And a lot of my relatives have a lot of kids and they need to put food on the table. (Point Lay) (SRB&A 2014b)

My grandfather sued the oil industry for trespassing on his Native Allotment. Many others of his generation had the same adversarial attitude. So people who looked up to my grandfather thought that this was the right attitude to have. So a whole generation of leaders grew up fighting industry, which was in some ways justified. There's a small group of people that were quiet and worked in the industry. Now our job is to put these young people to work and they're used to this adversarial attitude, it's hard. You ask if I know someone, whether it's a personal concern, it's everyone. Kids should be able to learn that they can work a rotational schedule, do subsistence, get benefits, and still be proud of their heritage and background. That's what industry should represent for us. (Barrow active harvester; Experience timeline: 1920 and ongoing; Experience location: North Slope. SRB&A Interview 2007) (SRB&A 2009)

When construction began on the NARL, there was a very definite change in the attitude of the people due to the introduction of employment to the community. You could really see a change in the cooperative sharing. [Illustrations?] Right after employment was introduced, everyone sort of abandoned the fur trading as a means of bartering for making ends meet. When everyone got jobs, things became easier. People began building wood frame homes, build some boats, outboard motors, etc. As things got a little easier, people started to stick to themselves around their immediate families since everyone was now in a position of self-reliance. So, at that time it became a little easier for everyone to look after themselves. (Utqiagvik) (Worl and Smythe 1986)

[You have to make a choice between] having to stay home and going to work. Because you've got to have money to get your fuel and you've got to have money to get your food. In the old days, everything you depended on was out in mother nature. But now you've got to have money in your pocket. It's starting to change a lot. (Point Lay) (SRB&A 2014b)

The (indiscernible) Lakes, Pik Dunes, and those hills, we call them the Blue Hills up past the Kogohokruk River, are our prime areas that our young men go for wolverine, wolf hunting and trapping. And this is there for our traditional clothing, for our -- because this sustains our natural warmth in our body, when we have our traditional clothing. So it's for our tradition and culture. We do not want to -- if those become restricted and -- you know, we will lose our traditional way of life. You know, you start to make -- knit a sweater and you loosen one -- and now you're pulling it out from the seams. And now it's -- you know, we can't be bare naked in the Arctic Slope. (Utqiagvik) (BLM 2004f)

There's people who have traplines, and it's just a matter of going out there in this cold because right now [February] it's the time of the year...it's the coldest time of the year and there's a very few people who go out and do it, because you have to travel miles and you have to go out and get these predators, wolverines and wolves. And it's just, you know, the excitement of getting them and bringing them home, actually getting these predators out there, that stuff we use to make our warm clothing, that's how it's been for years...you look back in the history and we had no stores, we had no way to buy up our clothing, it was out there for us to hunt, to make our clothing. (Point Lay) (Braem et al. 2017)

It is important to me because it was my wife and my kids' heritage. I tried to get in on as many activities as I could that involved that sort of traditional thing. [My son] is one of the better hunters and trappers in this community. And I was all for it, go with them, live with them, travel with them (his grandparents). It's the reason why people were here and it's a reason to stay here. (Point Lay) (SRB&A 2014b)

The person who is willing to work every day and passes his UA is willing to work every day. He wants to work every day. If he wants stuff he will work more. Alcohol and drugs will not help him make more money. The more money they want to make, there is a whole bunch of these kids I don't like, they make money all year long selling drugs and alcohol. They don't think of other people they only think of themselves and their own money. Why do you want to make more money, if you had a chance to do that why would you do that? I don't want to be like that, I want to make good money but not through selling drugs. I kind of wonder about these drug and alcohol dealers. They make more money and more profit but they are causing problems. Everyone has got to work and make a living. (Nuiqsut) (SRB&A 2012)

You will hardly see anybody doing seal pokes 'cause the weather warmed up too much, it won't let the seal oil render right—the way it's just traditionally been worked 'cause when it get too warm it gets rancid, strong. This cold weather we was brought up in the early '50s...I miss that a lot. 'Cause that food was staying fresher longer. Even our ice cellars held the food fresh longer. Nowadays we don't have ice cellars anymore 'cause they all melted. There's water and water gets in them and they get rotten and gaseous. People been known to have died from going in the cellars because of the gas that's produced like methane or whatever from the foods that rotted...we had to resort to electric freezers and walk in freezers. Temperature-controlled climate, however they might put it. (Point Lay) (Braem et al. 2017)

3.4.5 Environmental Justice

See traditional knowledge provided in the SUBSISTENCE USES AND RESOURCES, SOCIOCULTURAL SYSTEMS and ECONOMY sections for traditional knowledge that is also applicable to this section.

3.4.6 Recreation

Traditional knowledge holders from the six study communities generally do not consider their activities on the land to be “recreational.” Therefore, see traditional knowledge provided in the SUBSISTENCE USES AND RESOURCES section for traditional knowledge that is also applicable to this section.

3.4.7 Wild and Scenic Rivers

See traditional knowledge provided in the other sections of this report for traditional knowledge that is applicable to wild and scenic rivers in the planning area, particularly the Colville, Kokolik, and Utukok rivers.

3.4.8 Wilderness Characteristics

Traditional knowledge holders from the six study communities generally discuss “Wilderness Characteristics” in the context of their subsistence activities. Therefore, see traditional knowledge provided in the SUBSISTENCE USES AND RESOURCES and CULTURAL RESOURCES sections for traditional knowledge that is also applicable to this section.

3.4.9 Visual Resources

I hadn't seen nothing, other than lights at night. Just when you're coming in from this side, you can see the lights; that's the only thing. [It can be] somewhat distracting – it's irritating. Because I remember on the blue moon days you can see Prudhoe Bay when I was a kid. [It is] hard to say if they caribou are affected. Normally if you see lights, you wouldn't want to be hunting in that direction. (Nuiqsut) (SRB&A 2014a)

I still have a complaint [about the pipeline]: it is just too shiny. It reflects too much. (Nuiqsut) (SRB&A 2015)

You can notice them [pipelines] from far away. Even from my camp I can see them [still shiny]. (Nuiqsut) (SRB&A 2011b)

I keep telling them that pipeline's got to be covered, because it's too shiny. They colored the one down by POW 2 - the one on the Oliktok Point - they colored that, and you can't see that one. It's like a dark green, navy color, army color. (Nuiqsut) (SRB&A 2011b)

3.4.10 Transportation

See traditional knowledge provided in the CLIMATE AND METEOROLOGY, VEGETATION, and SUBSISTENCE USES AND RESOURCES sections for traditional knowledge that is also applicable to this section.

3.4.11 Economy

See traditional knowledge provided in the SOCIOCULTURAL MIXED CASH/SUBSISTENCE ECONOMY section for traditional knowledge that is also applicable to this section.

3.4.11.1 Local Labor

People talk about the past and hunting with skin boats and dog I've never done that. I grew up at a life where I drive a snow machine. I drive outboard motors and four-wheelers to hunt. That's the life I know and that's the life my kids know. Nobody uses dog teams or skin boats to hunt year-round and where do I get that money from? My job, dividends from the companies that we're enrolled in [village and regional ANCSA corporations] and that's just for my family. What about the other hunters that I have to work with? That's where their income comes from, the North Slope Borough and that's how we live and that's the life we know and that's the life we have to continue to move forward. I cannot go back to dog -- I cannot envision myself using a dog team, let alone train a dog, because I don't even know how. I can train

one to pee outside, but that's about it. You know, that's all animals are to us today. So I have to make up my mind and move forward and support projects like this that will benefit our people and not just us as Inupiat, everybody who lives on the North Slope, no matter what race, creed, or color they come from. That's the benefit of the -- of our system today. So we benefit everybody and that's why I have to support what we're doing here today. (Utqiaġvik) (BLM 2014b)

One of things that needs to be included in your alternatives is to see whether or not we can, economically, make Nuiqsut benefitted economy wise to create jobs. There's nothing. There's lot of people here that aren't working. They subsist, but we can't -- they can't go further out, because of their limited cash value that they have on hand. (Nuiqsut) (BLM 2018c)

I've noticed a lot of people who have worked for Prudhoe Bay or in the oil fields have moved to Fairbanks or Anchorage. It's easier for them to transit. Easier for them to spend their money. The ones who go to college get job offers to work in Anchorage. I'm afraid they will not come back. We have a brain drain. (Barrow active harvester; Experience timeline: since 1995 and ongoing; Experience location: North Slope. SRB&A Interview 2007) (SRB&A 2009)

I know they're always looking for qualified people. You need certification and lots of Iñupiat people are prepared for this. At the college we encourage them before they ever go get a job, they usually end up in laborer jobs because they're not prepared. They should notice this. (Wainwright) (SRB&A 2009)

Our younger generations are planning to move out because there are hardly any jobs. I have five kids of my own but one already moved out looking for a job. Oil companies promise jobs, but they hire people from the Outside and don't keep the promise to hire locals. My oldest son went to Barrow for a job for three or four years. (Nuiqsut active harvester; Experience timeline: since 2001 and ongoing; Experience location: Nuiqsut. SRB&A Interview 2007) (SRB&A 2009)

This doesn't happen to just the North Slope Borough. It goes right down to the families. If there is no work, it's the people who depend on oil development jobs who will be hurt. You hear this every year from the North Slope Borough. It'll affect everything we enjoy today. The revenues have been declining for years. They're laying off. People who thought they had jobs for life are unemployed. It's hard on the people. (Wainwright) (SRB&A 2009)

Alcohol problems. When you look at the people, right now I'm - have to deal with - without any federal monies, without no help, not from the churches, not from the state governments or from the federal governments - we have to deal with over 250 child cases every six months without no help, and a major portion of them is alcohol related because the parent's are worried about, 'Where am I going to feed my kids from? I can't find a job.' And we're sitting in the richest oil field in American. And major portions of our population are unemployed and can't get work, with the biggest oil field sitting right to the east of us here. George Edwardson. (Utqiaġvik) (MMS 1990)

3.4.11.2 Cost of Living and Economic Consequences of Subsistence Impacts

And then when the transportation to fly into a city, you don't get any discounts. You pay the price at price at all the time—the full 365 days a year. You know Alaska Airlines give out \$76 one-way from Seattle to New York. We fly here from Fairbanks its \$600 for a round trip. We don't get those deals. If some way, the state can help us to get some kind of deals. Everetts is trying, they are giving—once you reach Fairbanks that you'll be all right for a hotel. Which is highly needed because once you go Fairbanks, you are already spending your Christmas money and you go to a hotel. But Everetts is trying, they're trying they're giving once you land in Fairbanks, you're being delivered to a hotel for free and paying the taxes. We need to sometimes [unclear comment]. Give us a discount at Christmas holidays. WEIO. Activities that every community tries to come together and try to gather in one place. That was for transportation in that kind of way, maybe the state would have some more funding for the other people, people who don't have WEIO. Alaska Airlines does—give us some discount. (Anaktuvuk Pass) (BLM 2018a)

They changed everything in this area [TAPS]. It's not what it used to be. [It's] more expensive, more money from somewhere, especially groceries. You buy one loaf of bread it costs you six bucks. (Anaktuvuk Pass) (SRB&A Unpublished)

[It costs] 295 dollars for a bottle [of propane]. [The pipeline is] so close and yet so far away. We don't benefit from it. (Anaktuvuk Pass) (SRB&A Unpublished)

It's always been part of our whaling community. Due to our subsistence way of life, we try to avoid compensation from the oil companies. We deal with the IWC [International Whaling Commission]. If they see we get monetary assistance, it will impact us. I know Nuiqsut does, but they have agreements. I'm talking about Barrow. This is our livelihood. We don't want to lose this. Sure gas is expensive and the equipment. The cost is there. Each individual is burdened with the price of oil, fuel, and equipment. It's the same difference on and off shore. Most of these people fight for their subsistence. They get seasonal jobs so they don't have the money for fuel and equipment. Due to the impacts that affect most of our hunters. In Barrow we see this with the whaling captains and subsistence users. When I go to my cabin I used to be able to estimate exactly what I needed for fuel. Now you can't because you never know where the caribou will be. The cost of fuel is not going down. You've got to understand. They don't look back once they pass a community. They look to the next. Once they're done they're happy. They say, ok let's move. We could use the economics. (Barrow active harvester; Experience timeline: 1965 and ongoing; Experience location: Barrow. SRB&A Interview 2007) (SRB&A 2009)

When there are ships out there, you'll have to go further south to get your ugruk. You have to hunt ugruk in the summer to put skins on your whaling boat. When I have to change skins I will have to catch six the summer before I change them. You can't use the ones you catch a year or two before, they'll be rotten. It's expensive now. To get 10 gallons of gas you spend \$45. Oil is another \$30. The things the oil industry brought to the North Slope, more boats, more motors. You have to compete with that now. The things you buy up here are much more expensive than in Fairbanks or Anchorage. (Barrow active harvester; Experience timeline: since 1985 and ongoing; Experience location: Barrow. SRB&A Interview 2007) (SRB&A 2009)

We recognize the importance of oil and gas development for the national need for energy, it's not that we oppose this, it's that we want development to be done in a way that's not costing to us. We have increased our distance of travel to try to attempt a harvest as well as the number of trips that we make to try to harvest. These are costs that come up on our families. Our families have to try to go without other things because we're trying to continue our traditional lifestyle. (Nuiqsut) (BLM 2004e)

The economy these days. We try to hunt. We got game coming toward us, then these planes, choppers fly over. It costs a lot. I spend \$600 to \$1,500 to go hunting for two weeks. Then the choppers fly over and the game gets scared off. It's very frustrating to come home with nothing. (Barrow active harvester; Experience timeline: 2003 and ongoing; Experience location: Peard Bay. SRB&A Interview 2007) (SRB&A 2009)

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harvest. These are costs that come up on our families. Our families have to try to go without other things because we're trying to continue our traditional lifestyle. (Nuiqsut) (BLM 2004d)

Having to change my patterns of hunting and fishing. I had to change my calendar. I had to buy more gas and more food for my trips. I had to go to a whole new area. I couldn't hunt and fish in the places I traditionally went. I have hunted in my traditional area all my life; now I have been approached by security and told that I'm not allowed to have a firearm in that area. That took a big toll on me. And in my house I found myself very frustrated and angry. And there's no counseling of any kind and no help. I found myself a very unpleasant person to be around. I had a good wife who told me that I would have to leave to get counseling and the proper help that I needed to learn how to deal with these problems. Then I tried to educate myself on the matter of development and learn how I can't stop it, how it's for the good of the country and how we will have to learn to live with it. I found myself reading EIS's constantly at work and learning everything I could. And then I became a local leader. You see, I grew up on caribou, whale, fish - hamburger was not available, but now I can't do that as much. I have less time and need more money to hunt and now my kids aren't learning the subsistence ways. It's not a priority to them. And that takes a toll on me. It makes me disappointed but not surprised that this next generation doesn't depend on subsistence. There is a lot of stuff for people to fight about. There's a lot of mitigation funds coming into the village and the North Slope. And for that money the people all fight. Local leaders, families, and there's controversies in the village itself. And there's no formula or method for resolving these problems. It's all new, and we're just still learning how to properly use these impact funds and mitigate. (Nuiqsut active harvester; Experience timeline: 2001 and ongoing; Experience location: Nuiqsut. SRB&A Interview 2007) (SRB&A 2009)

Using the vouchers isn't enough. If you're gonna divert our caribou, that 10 gallons of gas ain't gonna get us there. We're gonna go further out, got to spend more money on gas. Mitigation hasn't done nothing, since they're gonna divert our caribou further south. That's from the oil company mitigation, from the city [City of Nuiqsut]. Some of these mitigations are being misused. Given to non-hunters around here. They want to gas up their vehicle, not go out there [hunting]. Go to City and write where you're going and what game you're going for. Some of the non-hunters mistreat it. Last year they shut it down cause there was misuse. (Nuiqsut) (SRB&A 2010b)

We have increased our distance of travel to try to attempt a harvest as well as the number of trips that we make to try to harvest. These are costs that come up on our families. Our families have to try to go without other things because we're trying to continue our traditional lifestyle. (Nuiqsut) (BLM 2004d)

The scientists at the beginning of all this, you could subsidize your diet with food at the store. Heck, no, we can't. It's over \$20 for a steak, \$50 for a box of 20 bullets. If you're a good hunter, that's 20 tuttus. That's a lot of meat for them 20 bullets. But we can't find them. These roads, all that gravel hauling -- I haven't been able to get tuttu in two years. Myself -- for my kids, we're getting from son, my son-in-law. Other people are giving to us because we're unable to. (Nuiqsut) (BLM 2018c)

We go to the store on payday. It's six to eight hundred dollars just to feed our family. And we still struggle to get to the next payday after paying six to eight hundred dollars to them. We can't subsidize our diet with these foods, what they cost... You're running all our food off and you're forcing us to subsidize our diet with what's at the store and order from other places. (Nuiqsut) (BLM 2018c)

You can see the frustration; frustrated not only with industry, but the State and agencies, because, How could this be happening to us? We used to be a thriving fishing community. Now all of a sudden we get two to three cisco. It is very frustrating to an individual and as a family as well. You spend time and effort and money. The average family will set two nets, sometimes three nets to try to make up the loss of one net. It takes a lot of money to fish; prepare the snowmobile, buy gas and nets and you have to spend time away from your family and home. Our diet consists of 30-60% Arctic cisco. (Nuiqsut) (MBC AES 2004)

When my mother and I go hunting, my mother always says, and I say, I think we need more meat because prices in our store are getting higher and higher. Hardly any jobs and gas is getting expensive. We decide

to go get meat. And we go by boat for caribou and there is Alpine aircraft and helicopters flying over and it seems like they are disturbing our hunting. And all of a sudden a helicopter files over us and scares our caribou away. My mother gets so mad. It used to not be like this before Alpine came around. Alaska Airlines too. Alpine helicopters and Frontier Airlines. (Nuiqsut active harvester; Experience timeline: 1990 and ongoing; Experience location: Nuiqsut. SRB&A Interview 2007) (SRB&A 2009)

This is a true statement in itself. Some of our relatives don't make that much money so they cannot even go out to hunt. Quite a few people have had to make longer travels whether it's for consumption or clothing. We're used to going to a general area. Now we have to go out further because there are no animals in the general area. (Barrow active harvester; Experience timeline: since 2001 and ongoing; Experience location: 20-30 miles south of Barrow. SRB&A Interview 2007) (SRB&A 2009)

And things that will help to reduce these are looking at the pipeline routes, making sure that the pipeline is high enough that the caribou are able to migrate, that we're able to follow the migration and hunt without having to travel to an area that's designed to allow us to hunt through them. The cost of our travels come out of our pockets, it takes away from other things that our families need. And it's really important that the cost of trying to live our lifestyle is not taken from our families. (Nuiqsut) (BLM 2004e)

Most of the people who can hunt have to work. If the hunting is 50 miles out, I will not go. Even if there is an agreement between the workers and the employers. If the animals are too far out, people will not go. They have to worry about the job that puts food on the table. This is why you find people in town who've never had a permanent job. (Wainwright active harvester; Experience timeline: Since 1972 and ongoing; Experience location: Wainwright. SRB&A Interview 2007) (SRB&A 2009)

It's always been part of our whaling community. Due to our subsistence way of life, we try to avoid compensation from the oil companies. We deal with the IWC [International Whaling Commission]. If they see we get monetary assistance, it will impact us. I know Nuiqsut does, but they have agreements. I'm talking about Barrow. This is our livelihood. We don't want to lose this. Sure gas is expensive and the equipment. The cost is there. Each individual is burdened with the price of oil, fuel, and equipment. It's the same difference on and off shore. Most of these people fight for their subsistence. They get seasonal jobs so they don't have the money for fuel and equipment. Due to the impacts that affect most of our hunters. In Barrow we see this with the whaling captains and subsistence users. When I go to my cabin I used to be able to estimate exactly what I needed for fuel. Now you can't because you never know where the caribou will be. The cost of fuel is not going down. You've got to understand. They don't look back once they pass a community. They look to the next. Once they're done they're happy. They say, ok let's move. We could use the economics. (Barrow active harvester; Experience timeline: 1965 and ongoing; Experience location: Barrow. SRB&A Interview 2007) (SRB&A 2009)

3.4.12 Public Health

See traditional knowledge provided in the SUBSISTENCE USES AND RESOURCES CONTAMINATION, SOCIOCULTURAL SYSTEMS MIXED CASH/SUBSISTENCE ECONOMY and ECONOMY COST OF LIVING AND ECONOMIC CONSEQUENCES OF SUBSISTENCE IMPACTS sections for traditional knowledge that is also applicable to this section.

3.4.12.1 Human Health

I have been a health aid for over a year now in Nuiqsut. And it is a tough job and I know. And I have found out in one year, that on our little children and the older people, their hemoglobin has dropped way down. Some of the little children have to have two doses of iron. And it's really hard. And it's because we are so short on our caribou and all the animals are scarce. Rosa Kaigelak. (Nuiqsut) (MMS 1979b)

Health problems. Thyroid problems. People are starting to complain about inner problems [like] asthma. Non-smokers too. Like my mother, her doctor told her that she should consider moving to where there's less development and better air. And this isn't from smoking. These health problems are between her family and her health. Should she leave the community and her family and her husband's grave? For her health? And we don't even have anything but a health aide here. When we came up with 15 people who have died of cancer, in the past few years, well, maybe something's happening here. I blame it on development. On the days when they have those flares from Alpine, my mother feels sick. And it's not just her. It's her peers too. It's not good for us, the people who live here, to have all that smoke in the village. The doctors don't know what's wrong with my mom. All the data doesn't match up. (Nuiqsut active harvester; Experience timeline: 2005 and ongoing; Experience location: Nuiqsut. SRB&A Interview 2007) (SRB&A 2009)

I know our health care system can't afford the cost that respiratory illness is causing our region right now. This data isn't even there to fully assess how much our exposure is, because the data sets are mixed into a very difficult assessment process where you have to know who the people are, where you're reading it from, to know where to get the data sets from. Some of our information might be in the village, some of it might be in Barrow, some of it might be in Fairbanks, some of it might be in Anchorage, some of it is nonexistent, but the cost is tremendous for one person on a ventilator for a short period of time. Our village suffered 10 people at one time on a ventilator. That's a small village. Why? Why? Why? I still don't have the answers, but I'm still here asking these serious questions. I want to believe that not all my grandchildren will need inhalers to breathe because there are many that do and some of them are very serious. When there's flares that are going on and there's lots of them, those are hard days for people who have trouble breathing and it's serious. This is a drawing point in the sand. Clean up what you've already done before you get into this area because the devastation is going to be tremendous. (Utqiagvik) (BLM 2014b)

When I started as a health aide in 1985 I had one asthma patient. By the time I went to the University of Washington for my physician assistant certificate in 1989, I had 20 to 25. When I came back in '91, there were 35. When I quit in 2000, there were over 60. The village make-up has not changed; it is still mostly Inupiaq. What was contributing, the most overwhelming issue, was that oil development around the community had increased and gotten closer. The worst nights on call were nights with many natural gas flares occurring. We could see it in the flares or in the fields around us. They release particles and they travel to us. The chance of an inversion will affect us. An inversion is a bowl-like air trap with cold air trapped by warm air. Increased concentrations of particulate matter occurs during these episodes. (Nuiqsut) (BLM 2003b)

Oil and gas. I think that that onshore development definitely has some issues with the resources. They use our lakes for water to build ice roads, and there are just a lot of little things that can add up to make the caribou have sicknesses. I've helped with little spills and I know they have that. It's the same thing with our humans. I can guarantee that at least 10 of my elders passed away from cancer, we had some from heart attacks, but at least 10 from cancer. I think it might be the air pollution, it might contain small particles, but

it adds up. That one with the tumor, I cut off the head and took the horns, but I left the rest for the animals to eat, cut the gut open so it wouldn't explode. (Nuiqsut) (SRB&A 2010b)

I'm concerned for our health too. You can see those flares for miles. What they're burning is, I think unwanted gas and it's harmful to us humans over here in the village and the animals too. I just see that smoke from miles away. Alpine's north and a lot of time we have north, northeast wind in the village here. It's not good for us when they burn. (Nuiqsut active harvester; Experience timeline: 2004; Experience location: Just up the river. SRB&A Interview 2007) (SRB&A 2009)

Other factors that need to be looked at are unknown toxins. Take samples at the DEW line (old military sites) along the coast at Oliktok Point. When we first came in 1973, there were so many barrels and debris scattered around. There was a lot of dumping early on that was just buried over and now this has created a problem with the onset of erosion. I think these could be some factors affecting the water. (Nuiqsut) (MBC AES 2004)

So we don't have good data sets to know what are all these things, but I know we have a tremendous amount of asthma. We have a tremendous amount of diabetes. We have a tremendous amount of heart disease. We have a tremendous amount of obesity. We have a tremendous amount of thyroid disease. These are all different things that are happening to our people, without the studies to assess what's going on, but we have only one industry that are contributing tons of emissions to the air that we breathe, the animals that we depend on, to the waters that we feed our families from and that we feed our -- we give to our families to drink, to bathe, to hunt, to fish in. (Utqiagvik) (BLM 2014b)

I know our health care system can't afford the cost that respiratory illness is causing our region right now. This data isn't even there to fully assess how much our exposure is, because the data sets are mixed into a very difficult assessment process where you have to know who the people are, where you're reading it from, to know where to get the data sets from. Some of our information might be in the village, some of it might be in Barrow, some of it might be in Fairbanks, some of it might be in Anchorage, some of it is nonexistent, but the cost is tremendous for one person on a ventilator for a short period of time. Our village suffered 10 people at one time on a ventilator. That's a small village. Why? Why? Why? I still don't have the answers, but I'm still here asking these serious questions. I want to believe that not all my grandchildren will need inhalers to breathe because there are many that do and some of them are very serious. When there's flares that are going on and there's lots of them, those are hard days for people who have trouble breathing and it's serious. This is a drawing point in the sand. Clean up what you've already done before you get into this area because the devastation is going to be tremendous. (Utqiagvik) (BLM 2014b)

There's a lot of social and health impacts because we're connected to the food chain and we eat the fish and caribou and, you know we, for the past 2–3 years we've been having the fish crisis, we're getting more fish that are being sick. I know of an elder family that don't even fish in the rivers no more they now go to the lakes because they know the river's contaminated by the legacy wells that eroded into the river by Umiat coming down and coming from up river going down to the ocean. (Nuiqsut) (Brown et al. 2016)

Like maybe there is something we have to do to protect ourselves if there is some type of adverse event, if there is gas in the air or drilling mud. And you know, the drilling mud has chemicals in it. and It sits there, but it dries up pretty easily and it can easily get into our air. It can get turned to dust. And that, because, you know, it is so windy it can dry pretty fast and you know, particulates from that dust can get in the air and that can really affect a lot of people's respiratory especially around here, people have— they are more susceptible to respiratory issues because of that. And there's a lot of people that have sensitivities, they have asthma, the have... you know. Some people are more sensitive to those kinds of things. And the younger they are, and the older – the risk is even more. (Nuiqsut) (BLM 2016a)

I have a concern on air quality too, we've had concerns on the Alpine and we didn't know how much of a concern it was until Alpine came out of what air quality, that's going to be a major concern for the village, we've seen some gathering stations in Prudhoe where they pollute quite a bit, especially during

the winter where it's real visible, so that's going to be another real concern of the village is air quality. We have quite a few numbers of children with asthma and bronchitis cases and we still haven't figured out exactly where's that coming from and how's that affecting the village, it's not only children, it's adults as well with bronchitis and asthma that didn't occur, these disease until later in their lives and that now occurring in Nuiqsut, most of these cases, so air quality is a big concern of mine. (Nuiqsut) (BLM 1997b)

And when you look at the cause of death, you will see a lot of suicide. And if you want to know why there is suicide, let me tell you something. These Elders taught us, you know, how we lived, who we are, and how proud we are supposed to be. Taught us how to hunt. And then these children of ours get big enough to go do that, what do they run into? State law that says no, federal law that says no, oil development that have destroyed the land. This is the reason for suicide amongst our young kids, something that should have never happened. We can't stop it. All we can do is try to teach them how to be proud of who they are. (Utqiagvik) (MMS 2009a)

And I'd just like to say that, you know, with the air emission, the air quality, it is not being analyzed. It's not being looked at. We have a lot of people with chronic illnesses that is being ignored. A lot of lung disease that -- that -- that federal, state government and other agencies have not even looked at. (Nuiqsut) (MMS 2009b)

When you look at the North Slope, we have the highest suicide rates of our youngsters. I lost two of my brothers. They both worked in the oil patch. One was a truck driver. They couldn't take it anymore and they both killed themselves. I can't afford that. I've got kids. When you teach a child what kind of culture and what kind of things their ancestors did, you can go into any village and you will end up with the same story. Teenagers, some of them in their pre-teens. You show them the longest lasting culture and they get to watch it die in their minds. I'm not worried because it's not going to die, but they don't know it. There's not one family who hasn't lost someone like that. There's going to be a dying peak in the next three to four years (of elders in the community). There was no oil and gas when I was valedictorian. I learned what I was taught. (Barrow active harvester; Experience timeline: since 1971 and ongoing; Experience location: The whole state of Alaska. SRB&A Interview 2007) (SRB&A 2009)

The worst part of it is, is the social disruption that occurs to our families. When you have the young hunter that's gone out and now this \$10,000 snow machine is broken and the parts to replace it cost \$500, but it costs over \$100 to even attempt to go out to do a short hunt, it's tremendous impacts to what we're thinking about, but when you have those young men commit suicide because they can't find a way to understand the changes to our lands and the changes to our way of life and the value they are felt (sic) as hunters to our village, it's a big problem for our whole community. When our young hunters see the infrastructure and they can make the logical decision that it's not logical to try and go out into traditional lands because you can't harvest in the way that our elders have taught us to. That's tremendous impacts. (Utqiagvik) (BLM 2014b)

There's no way for people to be protected from the air pollution. Its ultra fine particulate matter from these diesel exhaust emissions from all these drilling rig emission. All the big risk that's coming from oil and gas development rigs catching on fire or, not just the rigs, the chances for that—explosions happening. Cranes and equipment catching fire. All of that happened last year. There was, you know, a crane caught on fire and it was near the pipeline. What chances of that happening for a pipeline explosion are great, the risks and the chances are great. Yeah, for what little resources they want to get from the oil and gas underneath. But the chances of the oil still happening and the risk of all the air pollution greatly harming the people, all of that—those are not being monitored. All that always ozone being created—the warmer temperatures being created from all of this oil and gas industries are creating warmer temperatures. All those warmer temperatures are increasing all the ozone in the air and they say, well, there's not very much ozone and what they don't even monitor for it. They don't even put it in their analysis. How much of that ozone is in our air and it's affecting our children and is affecting our elders? It's affecting people's health. And they're not even trying to even acknowledge that. There's not even a working system for the state of Alaska or the health department or the planning department or the North Slope

Borough to even come together to even understand those issues of the health impacts. (Nuiqsut) (BLM 2019c)

Like maybe there is something we have to do to protect ourselves if there is some type of adverse event, if there is gas in the air or drilling mud. And you know, the drilling mud has chemicals in it. and It sits there, but it dries up pretty easily and it can easily get into our air. It can get turned to dust. And that, because, you know, it is so windy it can dry pretty fast and you know, particulates from that dust can get in the air and that can really affect a lot of people's respiratory especially around here, people have— they are more susceptible to respiratory issues because of that. And there's a lot of people that have sensitivities, they have asthma, the have... you know. Some people are more sensitive to those kinds of things. And the younger they are, and the older – the risk is even more. (Nuiqsut) (BLM 2016a)

A lot of people have been getting sick from the air lately. There are a lot of people that have been getting bronchitis and pneumonia for how many years. My buddy worked with the air quality people over here and he put out air canisters. He is still waiting to see the results of the air quality out here. (Nuiqsut) (SRB&A Unpublished-b)

She has noticed a change in the air as the industry was working westward. None of our people got sick and no one experienced any strange odors. We noticed our air started to change. Today the air has changed a lot. The air is blowing towards the village and today we are experiencing the problems with Alpine too. The blowout has really affected the village big time. (Nuiqsut) (SRB&A Unpublished-b)

I've been here -- a resident since then. I've seen some changes since I've been here, and mostly in the air quality portion. There's a lot of air pollution coming from a lot of this exploration and developments that are going on, especially with oil and gas industries. There's a lot of risk that come with the oil and gas industries in -- in our area. There's a lot of risk of blowout, fires, and a lot of hazardous air pollutants that are being produced from all of these developments with the flaring going on, with a lot of things going on here, especially with utilizing a lot of diesel equipment. There's a lot of diesel exhaust being produced. And a lot of the times, these diesel vehicles will be parked or running and idling and they'll be producing a lot of emissions, and it's at a ground level. This is where we breathe. A lot of our people are being impacted health wise. There's so many health problems that come with breathing in oil and gas development emissions, especially even from the diesel exhaust. Brings on cardiovascular health issues. It brings respiratory health issues to our people here. (Nuiqsut) (BLM 2018c)

If you talk to the elders every one of them takes oxygen. I don't know why, some of these elders can't breathe sometimes. It makes me worried. What happens if that blowout air comes over here? There are going to be a lot of sickness that comes from that. (Nuiqsut) (SRB&A Unpublished-b)

3.4.12.2 Sharing and Community Networks

Our Inupiat way of life is centered around sharing what food is available. We also exchange fish with other villages of the North Slope so that, in return, they may send us what they have that we don't have. The stores supplies only supplement food like milk for the babies. The main plane that carries our supplements does not come in for weeks in the wintertime when the weather is bad. Trisa Hopson. (Nuiqsut) (MMS 1979b)

And we support the villages up north, like Nuiqsut I know they will also have that problem like we have had in the years since the pipeline had come. And if those other villages stop having caribou too, when our caribou doesn't come around those villages up north they gather up money somewhere to bring us caribou. They go out hunting and take just caribou to bring up here because that's the only food we eat up here. We do eat fish, too, but we only have little graylings in our river. And they're usually easy to catch around last part of July and August in our little river. Delia Ahgook. (Anaktuvuk Pass) (BLM 1998d)

The other thing is, we share our food. I just sent over 3,000 pounds of Arctic cisco to Barrow to Wainwright and that's every year. We share with family across the North Slope and that's going to affect not just this community with our Arctic cisco, it's going to affect the North Slope. (Nuiqsut) (MMS 2006)

No, not enough. One caribou will feed your family but you got to worry about other families too. If you catch one you can't just keep it, so you have to share it between households. I would say about 10 [caribou is ideal]. Yeah – 10 or 12 [caribou], that would be enough to last all winter. When you haven't had it in a while and someone brings it over it is so exciting, when someone brings it over it is like a delicacy now, it is like a treat now. Caribou are so hard to find now, it is such a treat. When you catch one it is gone in a week because you are sharing it between so many families. We all watch out for each other when it comes to caribou. The other day a buddy of mine dropped off a caribou. There were 13 of us living in my house, so that one caribou went a long way for us. My kids, they love it. When you cut it up they can't get enough. (Nuiqsut) (SRB&A 2015)

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