BLM

Arctic Field Office, Fairbanks, Alaska

United States Department of the Interior
Bureau of Land Management

Environmental Assessment

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Right-of-Way
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LIST OF ACRONYMS

ACEC…….....Area of Critical Environmental Concern
ADEC .....…….Alaska Department of Environmental Conservation
ADFG.....…….Alaska Department of Fish and Game
ADNR.....…….Alaska Department of Natural Resources
ANILCA .....…….Alaska National Interest Land Conservation Act
AO .....…….(BLM) Authorized Officer
Arctic FO…….Arctic Field Office
BLM.....…….Bureau of Land Management
BMP…….Best Management Practice
CALON…….Circumarctic Lake Observation Network
CEQ .....Council of Environmental Quality
CFR.....…….Code of Federal Regulations
EA.....…….Environnemental Assessment
EFH.....Essential Fish Habitat
EIS .....…….Environmental Impact Statement
EO.....…….Executive Order
EPA .....…….U.S. Environmental Protection Agency
ESA.....…….Endangered Species Act
FLPMA .....…….Federal Land Policy and Management Act of 1976
FONSI…….Finding of No Significant Impacts
ft…….feet
H2…….Hypothesis 2
H3a,b…….Hypothesis 3 parts a and b
IAP .....…….Integrated Activity Plan
N…….North
NEPA.....…….National Environmental Policy Act
NMR ……..….Nuclear Magnetic resonance
NPR-A .....…….National Petroleum Reserve – Alaska
NPRPA .....…….Naval Petroleum Reserve Production Act
NSB .....…….North Slope Borough
NSF…….National Science Foundation

PVC…….Polyvinyl chloride
ROD.....…….Record of Decision
ROW.....…….Right of Way
SAP.....…….Subsistence Advisory Panel
UAF…….……University of Alaska- Fairbanks
USDOI.....…….United States Department of Interior
USFWS…….…….United States Fish & Wildlife Service
USGS…….……..United States Geological Survey
West…….…….West

Chapter 1

1. Introduction

This Environmental Assessment (EA) has been prepared in compliance with the National Environmental Policy Act (NEPA) to disclose and analyze the environmental consequences of granting a Right-of-Way (ROW) for activity proposed by the University of Alaska Fairbanks (UAF) on behalf of Christopher Arp. The Bureau of Land Management (BLM) follows the procedures contained in the agency's NEPA Handbook H-1790-1 (USDOI BLM 2010), which was issued June, 2010. An application was submitted on April 2, 2015 by the applicant to the BLM Arctic Field Office (Arctic FO) for activity on federal lands within the National Petroleum Reserve in Alaska (NPR-A) which are administered by the BLM's Arctic FO. Mr. Arp's proposal involves the manipulation of water levels of small lakes in the Inigok, Alaska area. The description of the Proposed Action (Section 2.1) provides details of the activity that would be conducted if the ROW were to be granted.

1.1 Need for the Proposed Action

The Applicant has filed a ROW application. The BLM's underlying need is to respond to the ROW application by considering the proposed activity in a manner that minimizes impacts to resources.

1.2 Purpose of the Proposed Action

The purpose of the proposed action is to allow the applicant to conduct the requested activity. The applicant's purpose with the proposed project is to understand how lakes interact with permafrost due to changes in ice contact with the lakebed.
A secondary purpose is to understand how this ecosystem change affects aquatic habitat and biota (sediment, chemistry, fish, invertebrates, and plants).

The proposed project is composed of several elements and is designed to meet the applicant's needs and objectives, including:

- Access to lakes in a way that allows for maximum operations while minimizing environmental impact.
- Supporting hypothesis 2 (H2) of National Science Foundation (NSF) grant - "Heavy snowpacks and wetter summers raise lake levels and thus cause floating ice conditions during subsequent winters".
- Supporting hypothesis 3 parts a and b (H3a,b) of NSF grant - **"**A regime shift to floating ice conditions requires multiple years to initiate a talik, but once a talik is established this new condition develops rapidly, and it is likely to persist".
- Compliance with all related requirements of the NPR-A Integrated Activity Plan/Environmental Impact Statement (IAP/EIS) Record of Decision (ROD) and all associated laws, regulations, permits, and approvals.
- Alternatives to the proposed project are evaluated on the basis of their effectiveness in meeting these objectives.

The BLM is authorized to approve ROWs on BLM-administered public lands pursuant to the 43 Code of Federal Regulations (CFR) 2800 which establishes procedures for issuing grants and 2360, operations within the petroleum reserve when authorization for such operations is required from the BLM.

Table 1.1 Legal Description:

Item	**Latitude & Longitude**	**Meridian, Township, Range, Section**
Pond Ini-002	N 69.999 W 153.087	U-8N, 5W, Sec 36
Lonely Wolf Pond	N 69.992 W 152.948	U-7N, 4W, Sec 5
Partialy Drained Lake Basin	N 69.997 W 152.937	U-7N, 4W, Sec 5
Sand Source	N 70.004 W 153.032	U-8N, 5W, Sec 36
Surrounding Area		U-8N, 5 W
Surrounding Area		U-7N, 4W
Surrounding Area		U-8N, 4W
Surrounding Area		U-7N, 5W

Key to table 1.1
N- North
W- West
U - Umiat

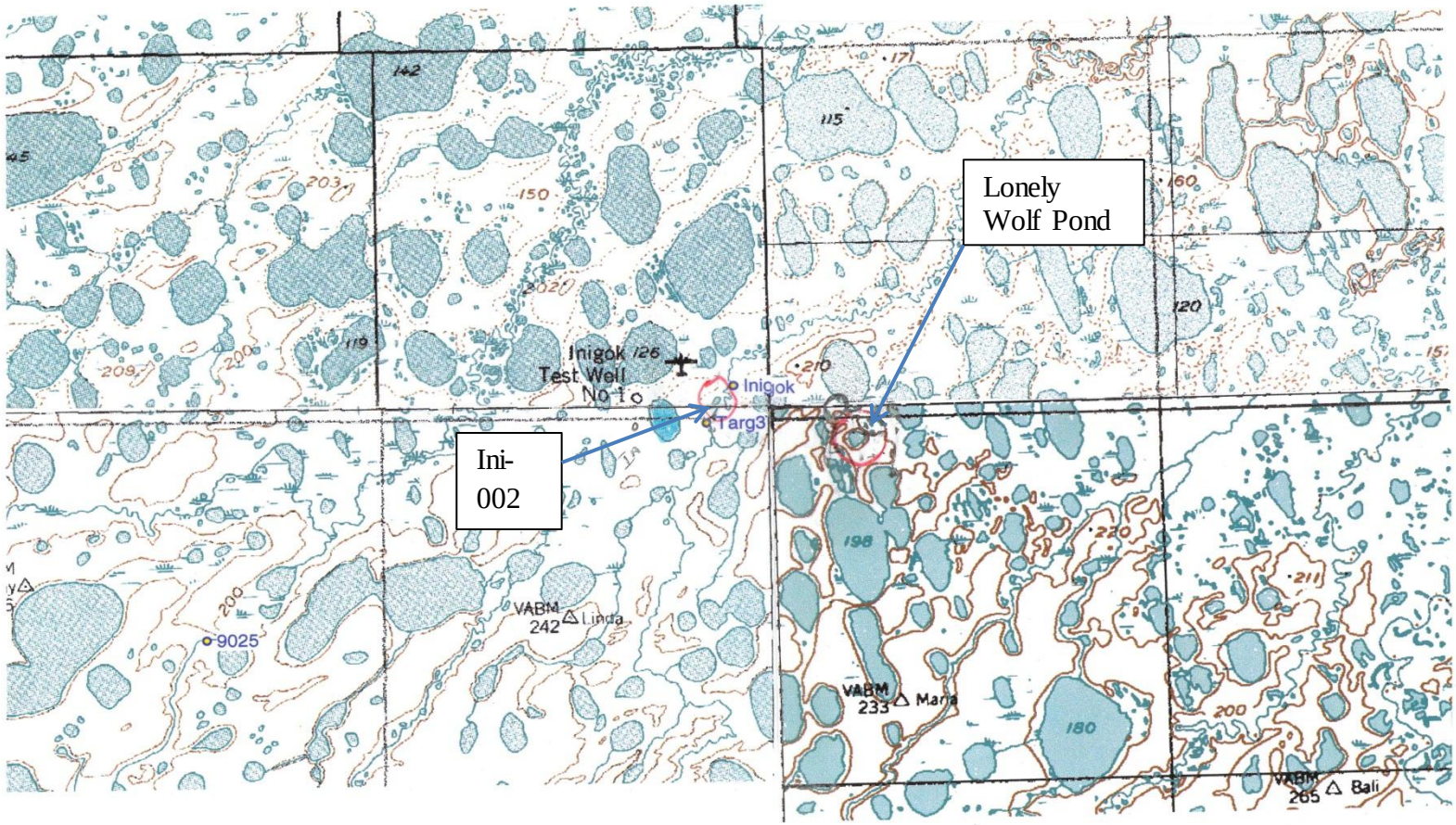

Figure 1. Map Overview of Proposed Project

1.3 Related Statutes, Regulations, Policies, and Programs

The 2012 IAP/EIS was completed to fulfill the BLM's responsibility to manage lands in the NPR-A under the authority of the: Naval Petroleum Reserve Production Act, as amended (NPRPA), Federal Land Policy and Management Act of 1976 (FLPMA), National Environmental Policy Act, and the Alaska National Interest Lands Conservation Act (ANILCA). Findings in the IAP/EIS and decisions reflected in the 2013 ROD were based upon an open and collaborative public process, as well as experience with multiple exploration programs completed in the NPR-A.

1.3.1 Federal Laws and Regulations

The proposed action must comply with numerous Federal laws and Executive Orders (EOs) that apply to activities on public lands – including those listed above. Key Federal and State controls associated with the proposed action were described in the 2013 IAP/EIS.

The proposed action is in conformance with the NPR-A IAP/EIS (2012), NPRPA, FLPMA, ANILCA, Endangered Species Act, Marine Mammal Protection Act, Sustainable Fisheries Act, EO 11988, and EO 11990.

1.3.2 Required Permits, Licenses, Authorizations, and Approvals

A number of Federal, State, and local permits and approvals must be obtained before the applicant can conduct proposed project. Primary regulatory authorization requirements for the proposed project are listed in Table 1.2.

Table 1.2 Permits and Authorizations for Proposed Project

Federal Authorizations and Approvals	
Bureau of Land Management (BLM)	Right-of-Way (ROW) Threatened and Endangered Species Determination Essential Fish Habitat Assessment (EFH) ANILCA 810 Evaluation and Findings Archaeological and Cultural Resources Clearance
U.S. Fish and Wildlife Service (USFWS)	Reply to BLMs Threatened and Endangered Species Determination
U.S. Army Corp of Engineers	Section 404 Permit
State Authorizations and Approvals	
Alaska Department of Natural Resources (ADNR)	Temporary Water Use Permit
Alaska Department of Fish and Game (ADFG)	Fish Habitat Permits FH15-III-00066 (Pond Ini-002),FH15-III-0067 (Lonely Wolf Pond)
Local North Slope Borough (NSB) Authorizations and Approvals	
North Slope Borough (NSB)	Administrative Approval

1.3.3 Related Environmental Analyses

The Council of Environmental Quality (CEQ) Regulation 40 CFR 1502.20 encourages agencies to "tier off their environmental impact statements to eliminate repetitive discussions of the same issues and to focus on the actual issues ripe for decision at each level of environmental review." The analysis for this EA is tiered off the National Petroleum Reserve-Alaska Integrated Activity Plan Environmental Impact Statement (USDOI BLM 2012) and ROD, which are incorporated in their entirety by reference in accordance with CEQ Regulation 40 CFR 1502.21.

1.4 Decision to be Made

The EA assists the BLM in project planning by evaluating the potential significance of environmental impacts. As defined by the CEQ, the significance of a federal action is determined by the context of the action in relation to the overall project setting, as well as the intensity of direct, indirect, and cumulative effects resulting from the project. If the BLM determines that the preferred alternative would not result in significant impacts beyond those already addressed in the USDOI BLM 2012 and ROD, the BLM would prepare a Finding of No Significant Impact (FONSI) and Decision Record approving the selected alternative. If the project is found to result in significant impacts, an Environmental Impact Statement may be prepared.

The decision-maker, BLM Authorized Officer (AO), will take into account technical, economic, environmental, and social issues (Table 1.3) and the purpose and need of the proposed project. This EA will be based on findings, management controls and protective measures of the NPR-A ROD (USDOI BLM 2013) as well as other laws and regulations. The scope of this EA includes analysis which enables BLM to select among alternatives that meet the purpose and need, and are within the BLM's jurisdiction [40 CFR 1506.1(a) (2)].

1.5 Scoping and Issues

Public notification of the Environmental Analysis was announced on June 22, 2015 in the NEPA Register on file at the Arctic Field Office Environmental Assessment web site. No public comments have been received through July 8, 2015. Development of the 2012 IAP/EIS involved extensive input from other Federal agencies, the State, the North Slope Borough (NSB), thousands of individuals, and many institutions. BLM guidelines include a list of issues that are addressed, where applicable, in NEPA assessments, (USDOI BLM 2012). Some elements are not present in the project area and are, therefore, not discussed further. A summary listing of related issues considered by Arctic FO Staff is provided in Table 1.3.

Table 1.3 Issues Considered in Evaluating Impacts

Issue Considered	Determination	Basis of Determination (See Note 1)[1]
ACEC's	Not Present	Protection provided by project specific stipulations, Arctic Field Office Non Oil and Gas Permit Stipulations.

Issue Considered	Determination	Basis of Determination (See Note 1)[1]
Air Quality	Not Present	
Cultural and Paleontological Resources	Not Present	No identified archaeological or paleontological resources in the project area. Cultural resources expected to remain unaffected; no impacts to potentially unidentified resources expected, based on and *de minimus* surface disturbance. Protection provided by: permit stipulations V.A and B.
Environmental Justice	Not Present	No disproportionately high and adverse human health or environmental effects to minority residents of the NPR-A have been identified for the proposed project. Impacts to subsistence use from this project in and of itself are not expected to be more than minor and short term. Protection provided by ANILCA 810 and Permit Stipulations II, III, and IX.
Fisheries	Potentially Affected	Protections provided by stipulations II-A, II-B, and XI-C,. EFH assessment finding is *not likely to adversely affect*.
Floodplains/Wetlands and Riparian Zones	Minimal Impact	Protections provided by stipulations II-A,F;X-A; XI-C-6,7
Invasive, Non-native species	Minimal Impact to Not Present	No ground vehicles would be involved in this operation.
Native American Religious Concerns	Not Present	
Recreation	Minimally Impacted	Protection provided by: permit stipulations V.A and B.II A, IIB,IIIA, IIIE, IIIF, IIIG, VIIA, VIIC, XA,XI AND XII.
Sociocultural Systems	Minimally Impacted to Not Present	Impacts to social systems from guided hunting activities are not expected to be more than minor and short term. Protection provided by ANILCA Section 810 and permit stipulations II, III, and IX.
Subsistence	Minimally Impacted to Not Present	Effects to subsistence resources are expected to be short-term and minor. ANILCA 810 Evaluation and Findings by BLM required, evaluation found no significant impact to fisheries, wildlife, or other resources. Additional protection provided by permit stipulation XI.
Threatened & Endangered Species Steller's eider	Not Present	

Issue Considered	Determination	Basis of Determination (See Note 1)[1]
Threatened & Endangered Species Spectacled eider	Not Present	
Threatened & Endangered Species Polar Bear	Not Present	
Non threatened and endangered birds	Minimally Impacted	No impacts are expected other than those already covered in 2012 NPRA Final IAP/EIS. Protections are provided by Stipulations VII.A; XI B.1, C4 and C5; XII B.
Non threatened and endangered mammals	Minimally Impacted	Caribou, grizzly bear, wolf, wolverine and small mammals (weasel, rodents, and shrews) may inhabit the area. No impacts expected to populations. Protection provided by Stipulations III.A, III.E, XI.B.1, XII.A, XII.B and XII.G, Appendix A.
Vegetation	Minimally Impacted	Protection provided by Stipulation X.A, Appendix A.
Visual Resource Management	Minimally Impacted	Protection provided by: permit stipulations II A, IIB,IIIA, IIIE, IIIF, IIIG, VIIA, VIIC, XA,XI AND XII.
Water Resources	Potentially Impacted	Protection provided by stipulations II-A, XI-C-6,7.*Lake levels at Pond UMI-002 will be artificially raised and levels at Pond Lonely Wolf lowered. Fisheries Issue 1 addresses the issue of water manipulation of the two subject lakes INI-002 and Lonely Wolf and no additional water resources discussion is required.
Waste (Hazardous/Solid)	Minimally Impacted	Protection provided by: permit stipulations XI.
Wild & Scenic Rivers	Not Present	
Wilderness Characteristics	Minimally Impacted	Protection provided by: permit stipulations IIIE, IIIF, IIIG, XA, and XI.

Key to Table 1.3:

ACEC- Area of Critical Environmental Concern
ADEC – Alaska Department of Environmental Conservation
ANILCA- Alaska National Interest Lands Conservation Act
BLM – Bureau of Land Management
EFH – Essential Fish Habitat
IAP/EIS- Integrated Activity Plan/Environmental Impact Statement
NPRA-National Petroleum Reserve in Alaska

Potentially Affected: The proposed action or alternative could result in potential impacts to resource or issues to the level that additional mitigation may be required, or there is a need to evaluate potentially significant issues.

Minimally Impacted: Resources or issues would not be affected to a degree requiring further analysis because either the expected impacts from the proposed action and alternative would be minimal, or standard protections (e.g., Best Management Practices (BMPs) and Stipulations from overriding BLM plans or other legal protections) would reduce impacts. Minimally impacted resources or issues will not be analyzed further in this EA.

Not Present: Resources or issues are not expected to be affected by the proposed action or alternatives because activities would occur at a different time or place. Resource or issues not present will not be analyzed further in the EA.

Notes, Table 1.3:
[1] Determination tiered from: 2012 IAP/EIS Vo1. 2, Chap. 4; 2013 ROD; and laws and regulations as noted.

In summary, BLM resource specialists have identified the following issue for further evaluation in this EA: Fish.

1.6 Public Involvement

Development of the NPR-A IAP/EIS (USDOI BLM 2012) involved extensive input from Federal agencies, the State, the NSB, thousands of individuals, and many institutions. Project-specific permit applications (see Table 1.2) are available for public review prior to agency decision making.

Chapter 2

2 Proposed Action and Alternatives

The proposed project is the temporary modification of the water levels of two small lakes (ponds) near Inigok Field Camp. Inigok is located on the southern edge of the Teshekpuk Special Area within the NPR-A. The proposed activity would occur in August 2015 – December 2018.

2.1 Alternative A Description of the Proposed Action

Mr. Arp has received a grant from the National Science Foundation (NSF) for the proposed project. The abstract of the project as found on the NSF website:

> "Shallow lakes and ponds may cover up to 40 percent of the land surface in Arctic lowland regions. Many of these water bodies traditionally freeze solid during the winter, preserving sub-lake permafrost and keeping soil carbon stocks immobile at depth. Slightly deeper lakes maintain some liquid water beneath floating ice, causing deep thaw zones in otherwise continuous permafrost. Evidence suggests that thinner ice growth in response to warmer, snowier winters is pushing many bedfast ice lakes to floating ice regimes. If such a regime shift becomes pervasive across lake-rich landscapes, resulting permafrost thaw and enhanced moisture and heat flux could generate positive feedbacks, further amplifying this regime change.
>
> This project examines the extent and dynamics of bedfast and floating ice lakes in relation to hypothesized interactions and feedback with permafrost and climate. A combination of remote sensing, field monitoring and geophysical measurements, experiments and physical models are used to isolate processes, quantify interactions and project changes. Project findings will be relevant locally for native village subsistence and for water supply to the petroleum industry, and globally for scientists studying permafrost thaw and Arctic climate change."

The proposed action would modify the water levels of two lakes: Pond Ini-002 and Pond Lonely Wolf (Figures 1-6) named as such for this project. According to Mr. Arp, much research has sought to understand the mechanisms, timing, and frequency of drainage events, as well as permafrost and vegetation succession, throughout lake-rich regions of the Arctic. The project proposes to experimentally manipulate two adjacent lakes; one with a floating ice regime (Pond Lonely Wolf) and the other, a bedfast ice regime (Pond Ini-002), with the goal of converting these regimes to the opposing conditions over the course of one winter and maintaining the new condition for this project's duration. The experiment is expected to provide a direct test of H2 and H3a,b beyond what is possible by monitoring natural variability, and provide critical data on initial sub-lake thaw and freeze rates for model calibration.

2.1.1 Pond Ini-002

Pond Ini-002 is located approximately 1 mile south of Inigok. This would be an experimental manipulation of a small lake in an attempt to temporarily convert it from bedfast-ice conditions (frozen solid) to floating-ice conditions (perennial liquid water). The proposal is part of a larger NSF funded project studying how lake ice interacts with permafrost and climate. The primary objective of this proposed experiment it to measure the rate of permafrost thaw below and around the lake once water levels are raised and it no longer freezes solid in the winter, which will be done with field measurements, sensor instruments, and geophysical techniques (including a pre-manipulation period). A secondary objective is to monitor any changes in water chemistry and biota (plankton, fish, and macrophytes). Baseline data has already been collected for these as part of ongoing research with NSF, the United States Fish and Wildlife Service (USFWS), and BLM. The data (Haynes 2013) includes fish inventory using multiple gear types which found only ninespine stickleback and limited densities compared to other lakes in the region.

The current depth of Ini-002 is 0.7 meters and the target depth is 2.2 meters. The manipulation of this lake would be to raise the water level by about 0.5 meters by installing a small dam at its outlet with a head gate. The drainage area of the lake is estimated to be 111 acres. At the lake outlet, the lake water surface is 3.3 feet(ft) above Fish Creek (tributary is named South Fork Upper Fish Creek).

Mr. Arp plans to construct two separate dams. The main dam would be approximately 15 ft long, 3 ft wide, and 3 ft high built of sand bags with a marine plywood center cut to fit the lake outlet channel. This dam would have an overflow outlet at 2.5 ft height above the current lake level and dropping to the natural outlet (made of 4" pipe) to prevent overtopping. The secondary dam would be place at a low spot just NE of the natural outlet to prevent spillage and erosion once the lake level is raised. This dam would be made entirely of sand bags (50 ft long, 2 ft wide, and 2 ft high).

Sand would be acquired from an adjacent tributary of Fish Creek and transported manually or via helicopter sling load to the site in late summer 2015. Several point bars on the floodplain above Fish Creek channel would easily supply this much sand, both up and downstream of the Ini-002 lake outlet (70.004 N, 153.032). The amount of sand needed is anticipated to be 335 cubic feet. The sand would be manually removed with a shovel to fill approximately 200-300 sandbags from each supply site and ideally slung by helicopter to dam site. .

The dam would not be effective until the early summer of 2016 when snowmelt fills this lake and water levels are elevated above natural levels. The intent would be to maintain these high water levels during two winters to convert this pond to floating ice conditions, after which the dam would be removed to bring water levels back to natural levels. Monitoring would occur before, during and after this manipulation (see Figures 3-4).

Pond Ini-002 is currently being monitored by the BLM approved Circumarctic Lake Observation Network (CALON) project. Ben Jones with the United States Geological Survey (USGS) has a BLM Right-of-Way (FF095373) for the CALON project.

Mr. Arp completed a survey of the site the beginning of June, 2015 and provided figure 2 as a result of the survey.

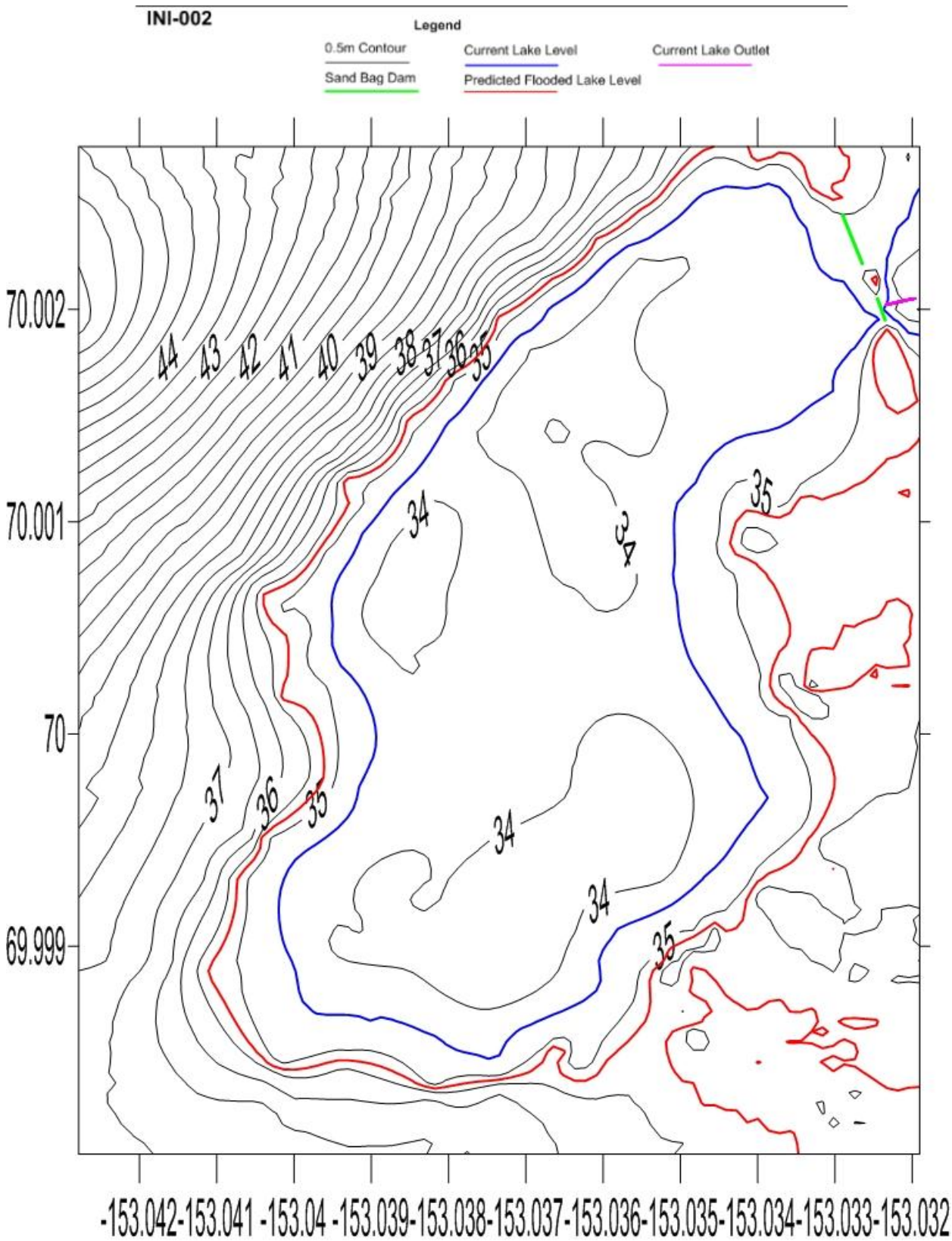

Figure 2: Diagram of Ini-002 site.

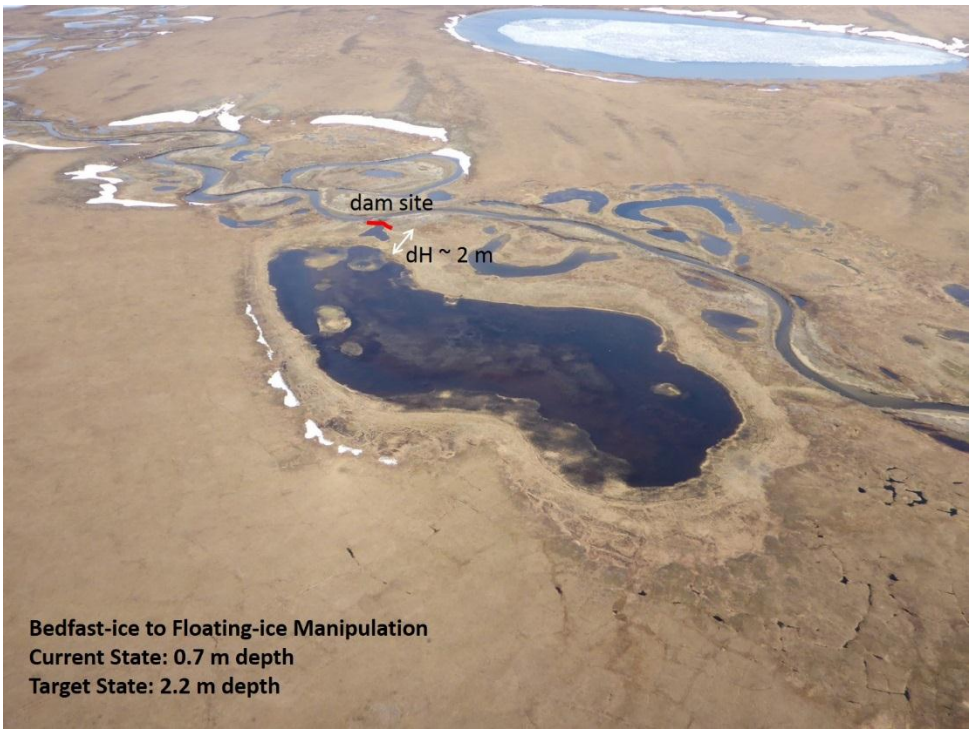

Figure 3: Oblique photo of Pond Ini-002

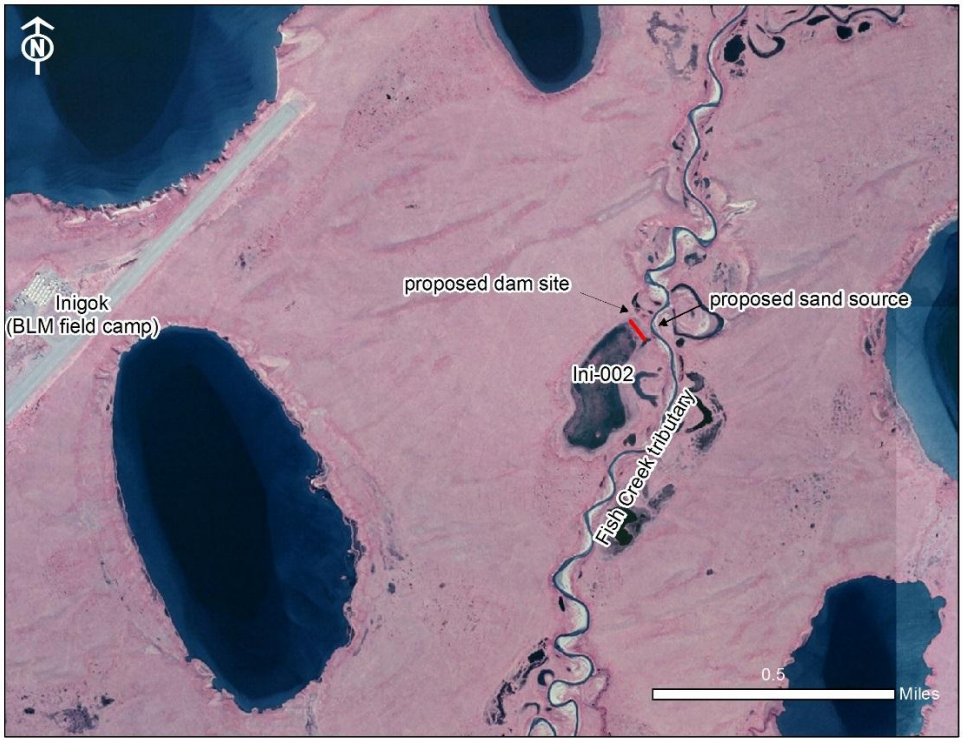

Figure 4: Color Infrared image showing Pond Ini-002.

2.1.2 Pond Lonely Wolf

Pond Lonely Wolf is located approximately 2 miles south of Inigok. This would be an experimental manipulation of a small lake in an attempt to temporarily convert it from floating-ice conditions (perennial liquid water near bed) to bedfast-ice conditions (frozen solid). This is part of a larger NSF funded project studying how lake ice interacts with permafrost and climate. The primary objective of the proposed experiment is to measure the rate of permafrost formation below and around the lake once water levels are lowered and it freezes solid in the winter, which would be done with field measurements, sensor instruments, and geophysical techniques (including a pre-manipulation period). A secondary objective is to monitor any changes in water chemistry and biota (plankton, fish, and macrophytes). Baseline data has already been collected for these as part of ongoing research with NSF, USFWS, and BLM. The data includes fish inventory using multiple gear types (Haynes 2013) which found only ninespine stickleback, though Mr. Arp suspects Alaska blackfish may occur in this lake as well.

Partial pond drainage for this project would be accomplished by using a gravity siphon over a 2-3 month period which may need to be aided initially by pumping to prime the siphon (several hours). Mr. Arp considered excavation but decided that it was not worth the risk of permanently lowering the water level of the lake. He expects to draw down water levels by approximately 3 feet and maintain these levels starting in the late summer of 2016. The water level would be lowered by about 0.5meters. The current depth of Lonely Wolf Pond is approximately 9 ft and the target depth is 4 ft. The intent would be to maintain these low water levels during two winters to convert this pond to bedfast ice conditions, after which the pond would be allowed to refill to natural levels. Monitoring would occur before, during and after this manipulation (see Figures 5-6).

The water removed would be routed down the outlet channel approximately 0.1 miles to a partly drained lake basin. This drained lake basin is approximately 80 hectors or 203 acres compared to 13 hectors or 33 acres of Lonely Wolf Pond, so applicant expects that this discharge could raise the downstream lake level by as much as 6 inches. However the drained lake basin feeds a tributary, so likely the additional drainage would have minor influence, but this should be verified with measurements.

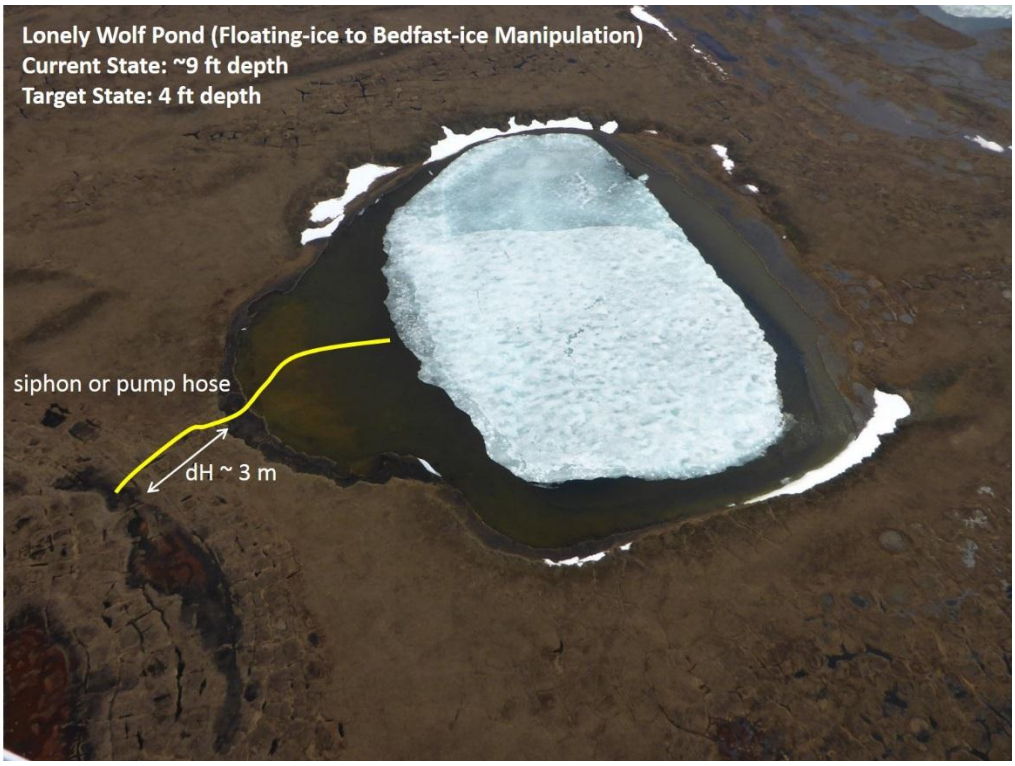

Figure 5: Oblique photo of Lonely Wolf Pond

Figure 6: Color Infrared image of Lonely Wolf Pond

2.1.3 Lake Monitoring

Both lakes would be instrumented and monitored for one year prior to these manipulations, including winter synoptic measurements and nuclear magnetic resonance (NMR) imaging of sub-lake talik geometry. The equipment is currently installed on the lake bed (anchor and buoy) and from Polyvinyl chloride (PVC) tubing installed into the lake bed and sticking about 1m above the lake surface. An additional water level sensor in a still well (1.5" drive point) is installed along the lake shore. The instruments record water level, bed and surface temperature, sediment (sublake) temperature at 2m,1m, and 0.5m depth, and incoming and reflected solar and photosynthetically active radiation (both sites).

Water level and bed temperature is measured with an Onset pressure transducer (U20), surface water temperature is measured with an Onset thermistor (U12-15), sediment temperatures are measured with 4-channel logger with thermistors (TMCXX-HD), and solar radiation with Onset pyranometers (S-LIB-MOO3). A specialized ice growth measuring buoy is located at Lonely Wolf with sensors manufactured by Beaded Stream LCC. Mr. Arp most likely will not install a real-time camera at this site, but will place a simple time lapse camera at the site to record changes visually.

Both ponds have small populations of ninespine stickleback. At Ini002 (dam site with raised water level) the fish normally die each year and need to be recolonized by connection to the adjacent river. If the water level is raised, Mr. Arp believes the fish have a much better chance of overwintering and surviving. The opposite would be the case at Lonely Wolf Pond (partial drainage). He expects that if water levels are lowered to target levels and the lake freezes solid all fish would be killed. While not the main purpose of this experiment, the impact on fish and subsequent plankton communities is of interest to Mr. Arp.

2.1.4 Access

The crew would fly via fixed wing charter to Inigok during the summers of 2015 – 2018. Access to each lake would take place on foot. If a helicopter is used to sling sandbags, the maximum number of take offs and landings would be 10. Snowmachines would be used for winter access during April 2016 – 2019. Limited helicopter access would be needed to Ini-002 in 2015 and 2018 and to Lonely Wolf Pond in 2016-17 during the late summer.

2.1.5 Deviation Requests

2.1.5.1 B-2b Best Management Practice Deviation Request

B-2 Best Management Practice
Objective: Maintain natural hydrologic regimes in soils surrounding lakes and ponds, and maintain populations of, andadequate habitat for, fish, invertebrates, and waterfowl.
Requirement/Standard: Withdrawal of unfrozen water from lakesand the removal of ice aggregate from grounded areas ≤4-feet deep may be authorized on a site-specific basis depending on water volume and depth and the waterbody's fish community. Currentwater use requirements are:

b. Lakes with only non-sensitive fish (i.e., ninespinestickleback or Alaska blackfish): unfrozen wateravailable for withdrawal is limited to 30% of calculatedvolume deeper than 5 feet; only ice aggregate may be removed from lakes that are ≤5.

Mr. Arp has requested a deviation from BMP B-2b. His justification for a deviation would be that he is proposing modifying one hydrologic regime and habitat in one direction and the other in the opposing direction with no net loss in habitat types within the region (i.e. bedfast to floating ice regime in case of Ini-002 Pond and floating to bedfast ice regime in case of Lonely Wolf Pond).

2.1.5.2 E-15b Best Management Practice

E-15 Best Management Practice
Objective: Prevent or minimize the loss of nesting habitat for cliff nesting raptors.
Requirement/Standard:

b. Any extraction of sand and/or gravel from an active river or stream channel shall be prohibited unless preceded by a hydrological study that indicates no potential impact by the action to the integrity of the river bluffs.

BMP E-15b was written to protect raptor nesting cliffs from large scale gravel/sand removal. Mr. Arp anticipates the removal of 335 cubic feet of sand. There are no known raptors nesting near the project location and no bluffs in the area. Therefore this BMP has no bearing on this study.

2.1.5.3 Non Oil & Gas Stipulation II J.

Any water intake structures in fish bearing or non-fish bearing waters shall be designed, operated and maintained to prevent fish entrapment, entrainment, or injury. Note: All water withdrawal equipment must be equipped with and must utilize fish screening devices approved by the Alaska Department of Fish and Game, Division of Habitat.

2.1.6 Camp and Fuel

There would be no camping at the site of either lake for this project. The BLM maintains a tent camp at Inigok that Mr. Arp and any crew would use for the project. There would be no fuel stored for this project.

2.1.7 Project End

After maintaining elevated water levels for two years (2016-2017), they would lower the water level in the fall of 2018 using a 4 inch siphon hose to below the dam base. Sand bags would be moved back to the original location where the sand was collected, emptied and leveled, and sand bags removed.

2.2 Alternative B No Action

Under the No Action Alternative, the Proposed Action would not take place on BLM managed land. None of the impacts that may result from approval of the ROW grant would occur. Federal lands would not be disturbed by the manipulation of 2 lakes within the NPR-A.

2.3 Conformance

The ROW grant would be subject to the BMPs from the NPR-A IAP/EIS (USDOI BLM 2012) and associated ROD (USDOI BLM 2013).

The proposed action is in conformance with the NPR-A IAP/EIS (USDOI BLM 2012) and associated ROD (USDOI BLM 2013), the NPRPA, FLPMA, ANILCA, Endangered Species Act, EO 11988, and EO 11990.

In the NPR-A IAP/EIS (USDOI BLM 2012), the BLM evaluated the direct, indirect, and cumulative effects of winter access in the NPR-A. This analysis concluded that the stipulations and BMPs provided adequate protection for surface resources and subsistence activities in the planning area.

As part of the most recent analysis, the BLM considered site-specific evaluations of exploration programs in the planning area over the past years, all of which received a Finding of No Significant Impact by the BLM. Findings for these winter programs included analysis of Threatened and Endangered Species, Essential Fish Habitat (EFH) and Subsistence Use under ANILCA 810, as well as coordination with the State Historic Preservation Office. In addition to BLM permits, other required Federal, State, and local authorizations were issued.

Chapter 3 Affected Environment

Chapter 3 describes the aspects of the human environment that may be affected by implementing Alternatives A or B. Resources and resource values analyzed in this EA are aspects of the human environment. The CEQ regulations discuss "human environment" (40 CFR 1508.14) as broadly relating to the biological, physical, social, and economic elements of the environment. The project area refers to the lands enclosed within the exterior boundaries of the proposed action (See Figure 1).

3.1 Introduction

Environmental characteristics of the general project area have been extensively described in the NPR-A IAP/EIS (USDOI BLM 2012, Vol. 1, Chapter 3), to which this analysis is tiered, with some site-specific features described below. Proposed activities would take place on the Arctic Coastal Plain, where temperatures average below freezing for 8 months of the year. A dramatic change to higher temperatures and longer day length occurs during the other 4 months. Annual precipitation is low, averaging 8 inches per year, with more than half falling as snow. Snow

cover is typically established in late September/October and disappears late May/mid-June. North Slope air quality meets the National Ambient Air Quality Standards and State of Alaska

The topography of the project area is generally flat to gently rolling, dominated by permafrost-related geomorphic features including polygonal patterned ground, shallow lakes, and extensive areas of wetland interlaced with small, meandering streams. Permafrost ranges from 650 to 1,330 feet deep, with an active thaw layer typically 1 to 2 feet deep.

Based on the proposed project and the issues analysis in Section 1.5, the following discussion of the affected environment covers Fish Resources. Review of the proposed project for potential issues (Section 1.5) indicated no or minimal impacts to air quality, cultural and paleontological resources, Flood Plains/Wetlands and Riparian Zones Native American Religious Concerns, Recreation, subsistence, non-threatened/endangered birds and mammals, vegetation, visual resource management, , or waste management (See Table 1.3 for complete list of issues considered).

Issue 1: Fish

The request by Dr. Arp to deviate from BMPs B-2b and B-2f was identified as a significant issue for fish. Both ponds are only utilized by ninespine stickleback and this species occurs in relatively low densities compared to many other Arctic Coastal Plain ponds and lakes (USFWS Arctic LCC-funded Fish CAFE project, unpublished data from ongoing study). Lonely Wolf Pond does not freeze to the bottom entirely each year and may provide overwintering habitat for ninespine stickleback. Pond Ini-002 freezes to the bottom each winter and any fish remaining in that lake during the fall do not survive the winter.

Chapter 4 Environmental Impacts

Activities proposed by UAF Dr. Arp are different from activities previously authorized in the NPR-A over the past years. Dr. Arp is proposing a research project in support of hypothesis for which he has received funding from a NSF grant. ADFG and ADNR have both approved the research and have no objections to the proposed manipulation. Below are related discussions of impacts in regard to fish resources which are the two resources that could potentially be impacted by the proposed action.

Because the proposed activities are not substantially different from those previously evaluated, and because no significant new scientific information or analyses have been developed since the most recent related evaluation (i.e., USDOI BLM 2012), this NEPA analysis will focus on impacts due to the project-specific/site-specific differences of the proposed action.

4.1 Direct and Indirect Effects

The proposed project for potential issues (Section 1.5) indicated no or minimal impacts to air quality, cultural and paleontological resources, flood plains/wetlands/riparian zones, Native American religious concerns, recreation, subsistence, non-threatened-endangered birds

and mammals, vegetation, visual resource management, or waste management (See Table 1.3 for complete list of issues considered). Issues specifically identified in Section 1.5 for further analysis in this EA are discussed below.

Issue 1: Fish

Proposed Action

The objective of BMP B-2b is to protect fish by minimizing where ice thickness may be increased beyond the naturally occurring depth, thus reducing and potentially fragmenting overwintering habitat space. However, the intention of the proposed action is to manipulate the pond in question (Lonely Wolf) so that is does freeze entirely to the bottom. In this particular case, the mortality of any ninespine stickleback in Lonely Wolf Pond would be offset by the increased survival of ninespine stickleback in the nearby Pond Ini-002, which would be manipulated to maintain unfrozen water during the winter rather than freeze to the bottom as it does naturally.

The objective of BMP B-2f is to protect fish from being harmed during water pumping activities or otherwise removed from a lake during the pumping process. However, in the case of pumping water from Lonely Wolf Pond, ninespine stickleback remaining in the pond after completion of water pumping will be frozen into the forming ice. Any ninespine stickleback entrained in the water being removed will still have a high likelihood of mortality, but will have a greater chance of survival into downslope waterbodies than those fish remaining in the lake. Similar to the rationale for the deviation from BMP B2b, the negative impact of pumping water from Lonely Wolf Pond will be offset by the increased survival of ninespine stickleback in Pond Ini-002 if damming is successful and it doesn't freeze to the bottom during winter.

No-Action Alternative

Under the no-action alternative, Dr. Arp would not conduct this lake manipulations study and no fish would be impacted.

4.2 Cumulative Effects

Chapter 4 addresses direct, indirect, and cumulative impacts of the Proposed Action and No Action alternative. The BLM has evaluated the cumulative effects of past, present, and reasonably foreseeable winter activities in and around the NPR-A in a series of recent NEPA analyses. This EA tiers to the most recent cumulative impact analysis in the USDOI BLM 2012 (Volume 4, Chapter 4 Section 4.8). That analysis was based on a timeframe of approximately 1900 through 2100, and a geographic range incorporating the entire North Slope of Alaska and adjacent marine waters. Based on the requirements of 40 CFR 1508.7, and guidance in the Council on Environmental Quality handbook on cumulative effects (CEQ, 1997), this analysis of

To date, no recent activities authorized by the BLM in the NPR-A, individually or in combination, have caused significant direct, indirect, or cumulative adverse impacts to the environment.

Results of previous analyses that have been incorporated by reference, and considerations of existing and proposed protective measures in the NPR-A, are key factors in limiting the cumulative impacts analysis to the issues listed below. Neither the Proposed Action nor the No-Action Alternative would add substantially to the incremental past, present, and future impacts described below.

Issue 1: Fish

The Arctic Coastal Plain (ACP) of the NPR-A has more than 10,000 lakes and ponds. Neither the negative impact of increased ninespine stickleback mortality in Lonely Wolf Pond nor the positive impact of increased survival of ninespine stickleback in Pond Ini-002 would be great enough to effect the local population of ninespine stickleback, which exist in extremely high numbers and densities throughout the ACP, including the Fish Creek Watershed where these ponds occur. Impacts from the project should remain local and temporary during the 2-3 year life of the project.

4.3 Mitigation and Monitoring

The stipulations (Appendix A) for the proposed action are a subset of the 2013 NPR-A IAP/EIS ROD, and project specific stipulations developed in the NEPA process.

The objective of the monitoring of the project is to ensure that all terms and conditions of the Federal ROW, the NPR-A ROD (USDOI BLM 2013) the NPRPA, and FLPMA (where applicable) are met.

4.4 Additional Mitigation and Monitoring

The BLM will incorporate the following additional mitigation measures into approvals for the UAF Chris Arp ROW. UAF shall:

1. Provide the BLM Arctic Field Office with a weekly activities summary report. The report shall be delivered in digital format every Monday to dwixon@blm.gov and s05mcint@blm.gov, through the applicable season(s) for the life of this project.

4.5 Summary of Environmental Consequences

The potential issues that were identified in the evaluation of the proposed action for this EA were Fish Resources. The analysis found that impacts would be short term and localized and that mitigation measures in Appendix A would adequately reduce any adverse effects to identified issues in the area. Likewise, the analysis also found that mitigation measures would adequately reduce any adverse effects to Fish, and Water Issues, which would also be short term and localized. The proposed action would not contribute to significant cumulative effects to Fish and Resources in the proposed project areas

Chapter 5 Consultation and Coordination

5.1 Agency Coordination

The proposed project has recently undergone review by the NSB, as well as other State and Federal agencies, as described in Section 1.5.

Mr. Arp provided the BLM with permit applications and support documentation that summarize the proposed project and their compliance with applicable stipulations. The BLM and Mr. Arp discussed the proposed action as the proposed program was being developed. These discussions will continue as the project progresses.

5.2 Public Coordination

The project was announced on the BLM NEPA registry on June 22, 2015.

5.3 List of Preparers

Table 5.1 List of Preparers

Name	Title	Responsible for the Following Section(s) of this EA:
Richard Kemnitz	Hydrologist	Water Resources, Floodplains/wetlands and Riparian Zones
Stacie McIntosh	Arctic Field Office Manager	Authorized Officer Cultural and Paleontological Resources
Stacey Fritz	Anthropologist/Subsistence Specialist	Environmental Justice, Native American Concerns, Sociocultural Systems, Subsistence, ANILCA 810
Debbie Nigro	Wildlife Biologist	Table 1.1 sections T&E species spectacled and Steller's eider and polar bear, Section 2.1.7, Section 2.1.9 Wildlife protection and Encounter Plans, Section 4.5 Additional Mitigation and Monitoring stipulations 2 - 14
Matthew Whitman	Fish Biologist	Fisheries
Donna Wixon	Natural Resource Specialist, Project Lead	Lands and Realty Recreation, Wilderness Values, Visual Resource Management
Dave Yokel	Wildlife Biologist	Table 1.3 section T&E species polar bear, invasive species, mammals and vegetation.

ANILCA Requirements

Section 810 Subsistence Evaluation

This proposed action will not significantly restrict subsistence uses. No reasonably foreseeable and significant decrease in the abundance of harvestable resources or in the distribution of harvestable resources, and no reasonably foreseeable limitations on harvester access will result from the proposed action.

Chapter 6 References

Council on Environmental Quality (CEQ). 1997. Considering Cumulative Effects Under the National Environmental Policy Act. December.

Haynes, T. B., A. E. Rosenberger, M. S. Lindberg, M. Whitman, and J. a. Schmutz. 2014. Patterns of lake occupancy by fish indicate different adaptations to life in a harsh Arctic environment. Freshwater Biology 59:1884–1896.

USDOI BLM 2010. NEPA Handbook (H-1790-1),

USDOI BLM. 2012. National Petroleum Reserve-Alaska Integrated Activity Plan Environmental Impact Statement. November.

USDOI BLM. 2013. National Petroleum Reserve-Alaska Integrated Activity Plan Environmental Impact Statement. Record of Decision. February.

APPENDIX A

ARCTIC FIELD OFFICE NON OIL AND GAS PERMIT STIPULATIONS

[This is a subset of the 2013National Petroleum Reserve-Alaska Integrated Activity Plan Record of Decision, Utility Corridor Resource Management Plan/Final Environmental Impact Statement, and the Colville River Special Area Management Plan. Stipulations and Best Management Practices from these documents along with frequently utilized resource-specific stipulations are incorporated. Special Recreation Permit holders meet most requirements by following the guidelines in Leave No Trace, Alaskan Tundra.]

I. AUTHORIZED OFFICER

The Authorized Officer (AO) is the Manager, Arctic Field Office.

II. AIR & WATER

A. All operations shall comply with applicable Air and Water Quality Standards of the State of Alaska.

B. Grey wash water and kitchen waste water may be filtered to remove the solids and the liquid discharged to the land surface, provided the disposal area is a minimum of 100 feet from any water body or stream.

C. Water withdrawal from rivers and streams during winter is prohibited.

III. AIRCRAFT

A. Hazing of wildlife by aircraft is prohibited. Pursuit of running wildlife is hazing. If wildlife begins to run as an aircraft approaches, the aircraft is too close and must break away.

D. Use of aircraft, near known subsistence camps and cabins, and along rivers or during sensitive subsistence hunting periods (spring goose hunting and fall caribou and moose hunting) should be kept to a minimum.

E. Aircraft used for permitted activities shall maintain an altitude of at least 2,000 feet AGL (except for takeoffs and landings) over the Teshekpuk Lake Caribou Habitat Area (Map 2) and the Utukok River Uplands Special Area (Map 1) from May 20 through August 20, unless doing so would endanger human life or violate safe flying practices. Aircraft use (including fixed wing and helicopter) in the Goose Molting Area (Map 2) should be minimized from May 20 through August 20, unless doing so would endanger human life or violate safe flying practices.

V. CULTURAL/PALEONTOLOGICAL RESOURCES

A. In accordance with the Archaeological Resources Protection Act (16 U.S.C. 470aa), the removal or disturbance of archeological or historic artifacts is prohibited. The excavation, disturbance, collection, or purchase of historical, recent, ethnological, or archaeological specimens or artifacts is prohibited. Such items include both prehistoric stone tools and sites, as well as historic log cabins, remnants of such structures, refuse dumps, and other such features. The disturbance, excavation and collection of vertebrate paleontological (fossil) remains are also prohibited.

B. Any cultural or Paleontological resource discovered by the holder, or any person working on his behalf, situated on lands owned or controlled by the United States shall be promptly reported to the AO. Discoveries must be left in place to allow for an examination by BLM cultural or paleontological specialists. GPS Coordinates of any discovered cultural resources should be obtained if possible and reported to the AO.

VI. FIRE

A. The BLM, through the AO, reserves the right to impose closure of any area to operators in periods when fire danger or other dangers to natural resources are severe.

B. The authorized user shall be financially responsible for any damage done by a wildfire caused by its operations. Costs associated with wildfires include but are not limited to, damage to natural resources and costs associated with any suppression action taken on the fire.

VII. OPERATIONS

A. It is the responsibility of the authorized user to ensure that all individuals brought to the project area under its auspices adhere to these stipulations. Authorized users of the planning area shall provide all employees, contractors, subcontractors, and clients with a briefing regarding stipulations applicable to the lease and/or permit.

C. The provisions of this permit do not relieve the Permittee of any responsibilities or obligations required by the laws or regulations of the State of Alaska Department of Fish and Game or the U.S. Fish and Wildlife Service, or other applicable regulations related to this permit

D. The authorized user shall protect all survey monuments and be responsible for survey costs if remonumentation is required as a result of the user's actions.

E. Survey monuments include, but are not limited to, General Land Office and Bureau of Land Management Cadastral Survey Corners, reference corners, witness points, U.S. Coast and Geodetic benchmarks and triangulation stations, military control monuments, and recognizable civil (both public and private) survey monuments.

F. In the event of obliteration or disturbance of any of the survey monuments above, the Permittee shall promptly report the incident, in writing, to the Authorized Officer and the respective installing agency, if known. Where General Land Office or Bureau of Land Management right-of-way monuments or references are obliterated during operations, the Permittee shall secure the services of a registered land surveyor or a Bureau Cadastral surveyor to restore the disturbed monuments and references using surveying procedures found in the Manual of Surveying Instructions for the Survey of Public Lands of the United States, latest edition. If the Bureau cadastral surveyors or other Federal surveyors are used to restore the disturbed survey monuments, the Permittee shall be responsible for survey costs.

IX. SUBSISTENCE

A. The permittee will take no action that interferes with subsistence activities of rural users or restricts the reasonable access of subsistence users to public lands. This may include but is not limited to disturbance of wildlife and their movements near subsistence hunters, and damage to cabins, trails, traditional campsites or caches used by subsistence users. The permittee must familiarize themselves, their team, and their pilots with any subsistence

camps and cabins located near their project site (map available upon request) and, when using aircraft, make all reasonable efforts to avoid disturbing hunters.

B. The Arctic Field Office will determine on an application-by-application basis what level of consultation will be required in order to provide adequate notification to communities, including whether the project merits application of the complete H-1 (Subsistence) Best Management Practice from the 2013 NPR-A EIS/IAP Record of Decision. Determination will be based on Arctic Field Office experience and on communication with representatives of the BLM NPR-A Subsistence Advisory Panel. Permittee will respond to questions and any reasonable requests for consultation that tribes and/or communities may have. Information on permits will be included on the NPR-A Permitted Projects spreadsheet that is distributed to tribal governments and North Slope communities. Permittee is encouraged to correspond with Arctic Field Office anthropologist/subsistence specialist if they have any questions or concerns: Stacey Fritz: (907) 474-2309, sfritz@blm.gov

X. VEGETATION

A. All activities shall be conducted to avoid or minimize disturbance to vegetation. The clearing of vegetation for camps or aircraft landing areas is prohibited.

XI. WASTE

A. HUMAN WASTES

1. Toilet paper: Toilet paper must be packed out, or a natural alternative used. Natural options for toilet paper include snow, smooth stones or sticks, leaves and moss. Natural TP options should be disposed of the same as the human waste. Feminine hygiene products and diapers must also be packed out.

2. Urine: Urine can attract animals seeking salt: avoid urinating on plants that can be defoliated by animals attracted to the salt residue. Urinate 200 feet away from camps and trails on rock, bare ground, or water sources.

3. Recommended human excreta disposal in riparian areas: Packing out human excreta is the most eco-friendly means of waste disposal and the toilet can be located wherever is most appropriate. This method helps areas that receive high-levels of use retain their naturalness, and preserves pristine areas. Disadvantages include: it incurs cost and requires logistical considerations.
   The WAG (Waste Alleviation and Gelling) Bag has become the overall term for any pack-it-out bag system. It generally involves one bag with which holds the excrement and another sturdier, sealable bag. Commercial vendors of waste bag kits, powders and supplies include ReStop, Biffy Bags, and Cleanwaste.

B. GARBAGE

1. Attracting wildlife to food and garbage is prohibited.

2. Burial of garbage is prohibited. Burial of human waste is prohibited except as authorized by the AO. [Special Recreation Permit holders meet all requirements by following the guidelines in Leave No Trace, Alaska Tundra.]

3. Areas of operation shall be left clean of all debris.

C. FUEL

1. Notice of any spill shall be given to the AO as soon as possible or to the BLM Arctic Field Office Natural Resource Specialist, Donna Wixon (work/message 907-474-2301). Other Federal, State, and NSB entities shall be notified as required by law.

2. All spills shall be cleaned up immediately and to the satisfaction of the AO and all agencies with regulatory authority over spills, including the Alaska Department of Environmental Conservation (ADEC),(1800-478-9300) (Alaska Statute Title 18, Chapter 75, Article 2).

3. State and Federal safety standards for fuel handling will be followed.

6. Fuels shall not be stored on the active floodplain of any waterbody. Although fuels may be off-loaded from aircraft on ice, fuels shall not be stored on lake or river ice.

7. Refueling of equipment within 500 feet of the active floodplain of any waterbody is prohibited. Fuel storage stations shall be located at least 500 feet from any water body with the exception that small caches (up to 210 gallons) for motorboats float planes, ski planes, and small equipment, e.g. portable generators and water pumps, will be permitted.

D. PESTICIDES

Use of pesticides without the specific authority of the AO is prohibited.

XII. WILDLIFE

A. Chasing wildlife with ground vehicles is prohibited. Particular attention will be given to avoid disturbing caribou.

B. The feeding of wildlife is prohibited and will be subject to non- compliance regulations.

G. With the exception of authorized guide hunting trips, hunting and trapping by permittee's employees, agents, and contractors are prohibited when persons are on "work status." Work status is defined as the period during which an individual is under the control and supervision of an employer. Work status is terminated when the individual's shift ends and he/she returns to a public airport or community (e.g., Fairbanks, Barrow, Nuiqsut, or Deadhorse). Use of permittee facilities, equipment, or transport for personal access or aid in hunting and trapping is prohibited.