
National Park Service
U.S. Department of the Interior

Bering Land Bridge National Preserve
Alaska



Grazing Exclosures

Environmental Assessment
February 2012



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For additional information, copies of this EA, or to send in comments by mail, email or fax, please contact:

Jeanette Pomrenke, Superintendent
Attn: Grazing Exclosures EA
Bering Land Bridge National Preserve, NPS
P.O. Box 220
Nome, AK 99762
Tel 907-443-2522 Fax 907-443-6139
Jeanette_Pomrenke@nps.gov

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ACRONYMS AND ABBREVIATIONS

AC	Advisory Circular
ADNR	State of Alaska, Department of Natural Resources
aka	Also Known As
ANILCA	Alaska National Interest Lands Conservation Act
ARCN	Arctic Network of the NPS Inventory and Monitoring Program
BELA	Bering Land Bridge National Preserve
CFR	Code of Federal Regulations
dBA	A-weighted Decibel
DO	NPS Director's Order
EA	Environmental Assessment
EO	Executive Order
FAA	Federal Aviation Administration
GMP	General Management Plan
NEPA	National Environmental Policy Act
NHPA	National Historic Preservation Act
NPS	National Park Service
ORV	Off-Road Vehicle
PL	Public Law
SHPO	State Historic Preservation Officer
USC	United States Code
VFR	Visual Flight Rules
WEAR	Western Arctic National Parklands

1.0 PURPOSE AND NEED FOR ACTION

1.1 PURPOSE OF AND NEED FOR ACTION

The National Park Service (NPS) is considering establishing 18 fenced grazing enclosures to study lichen growth rates and reindeer (*Rangifer tarandus*) grazing effects in Bering Land Bridge National Preserve (BELA), Alaska (Figure 1-1) starting in the summer of 2012. Each enclosure fence would be 30 ft x 30 ft, 6 feet high, established for 30-50 years, and accessed by helicopter for both construction and regular readings of vegetation plots. Reading of vegetation plots would be conducted once every 10 years. The project area is eligible for wilderness but is not designated as wilderness. The complete proposed action and the no-action alternative are described in Chapter 2. The two primary purposes of the proposal are 1) to provide data for a scientifically-based reindeer grazing management plan, and 2) to provide long-term data on caribou habitat quality and forage quantity. A secondary objective of this 2nd purpose is to provide long-term data on climate-driven vegetation change in the absence of grazing.

Since 1978, BELA's 2.8 million acres has been allocated to reindeer grazing in five main grazing allotments (Figure 1-2). The allotments are not fenced nor do they have internal fenced pastures. BELA's enabling legislation provides for long-term reindeer grazing according to sound range management practices which do not degrade Preserve resources. NPS issues permits for reindeer grazing to four allotment holders on a regular basis for a maximum number of animals on each range, typically 1,000-2,000 (Table 1-1). The NPS would like to eventually develop a reindeer grazing management plan in which the numbers of reindeer permitted are based on the desired condition of the natural forage and according to the best available science. While it would be preferable to construct the 18 enclosure fences outside of eligible wilderness, it is preferable that the enclosures be co-located with long-term vegetation monitoring plots of the Preserve.

Recognizing that reindeer herding can result in damage to vegetation and soils, in the 1990s the NPS conducted a project to radio collar and track reindeer in conjunction with the allotted herders, resulting in a modest level of quantification of animal use patterns during that decade (Harris, 1999). Beginning in 2000, the NPS began a program of long-term monitoring of winter range vegetation (Holt et al., 2008). This program resulted in a network of 78 long-term vegetation monitoring plots throughout BELA (excluding the panhandle) in landcover types with significant lichen for reindeer forage. This program was very effective in distinguishing between the vegetation condition of heavily grazed areas and lightly grazed areas. Unfortunately, very limited quantification of grazing pressure (i.e., number of animals using a range) was available in BELA or on the northern Seward Peninsula. The only data available on grazing pressure came from the southern Seward Peninsula, which is in a different climatic zone with different vegetation and recovery patterns. Holt et al., 2008 suggested that a way to establish the condition of BELA's winter range would be to characterize it relative to the grazing endpoints of "highly degraded" and "ungrazed". The NPS has found examples of severe damage due to apparent overgrazing in BELA. One way to characterize an "ungrazed" winter range over the long-term would be to exclude ungulates from grazing. This is typical range management practice accomplished by fencing a patch of forage habitat.

The plant communities that are susceptible to the greatest grazing damage are the slow-growing tundra lichen communities that form the bulk of the reindeers' diet during the eight winter months typical of BELA. In this treeless, lowland to alpine landscape, lichen-dominated communities represent most of the vegetation in the Preserve. Lichens represent approximately 40% of the species in this landscape (including several rare Beringian and circumpolar species) and most of the biomass (Jorgenson et al., 2004). Studies from this area and other areas in the North American arctic suggests that terrestrial lichen communities may require between 30 and 160 years to achieve late-successional diversity and abundance after stand-replacing disturbance (Holt et al., 2008; Black and Bliss, 1978; Christiansen, 1988).

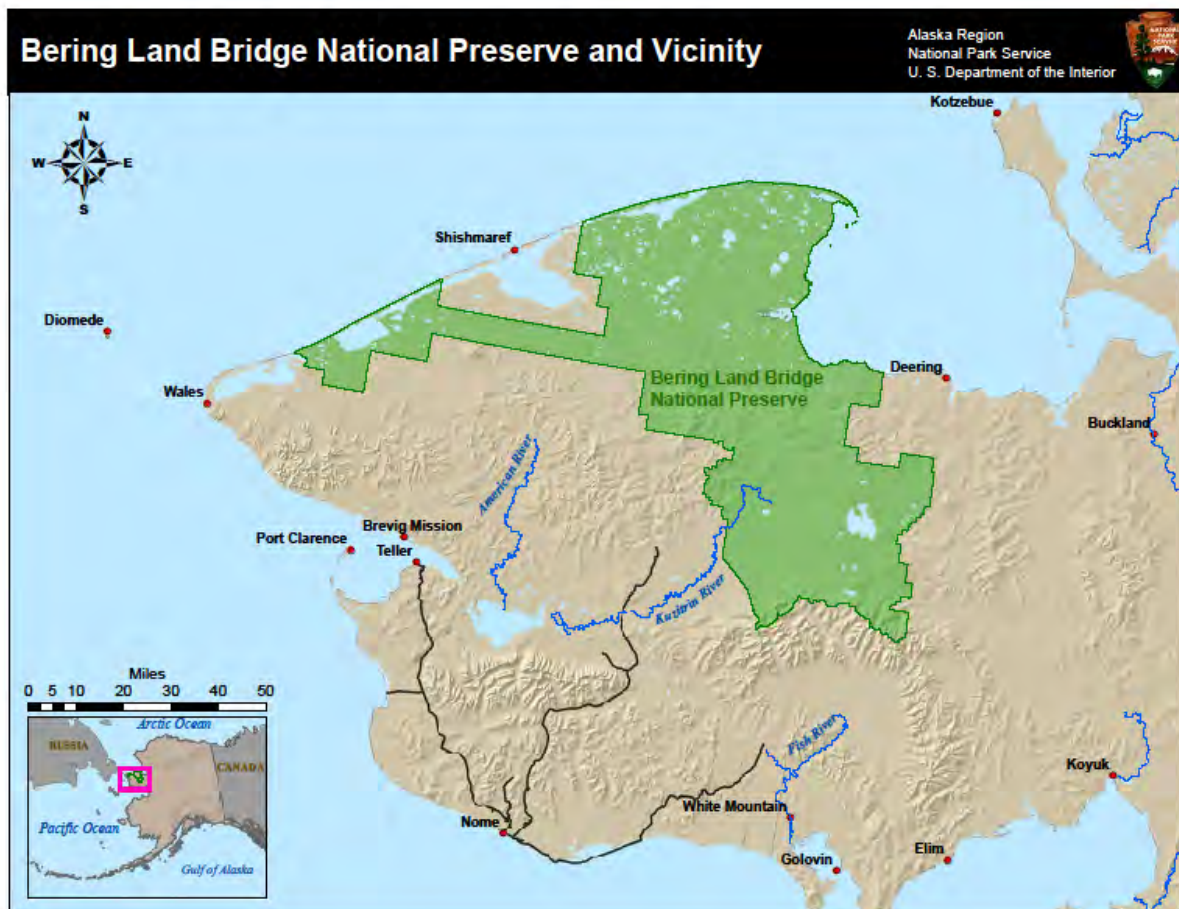


Figure 1-1. Vicinity map of Bering Land Bridge National Preserve.

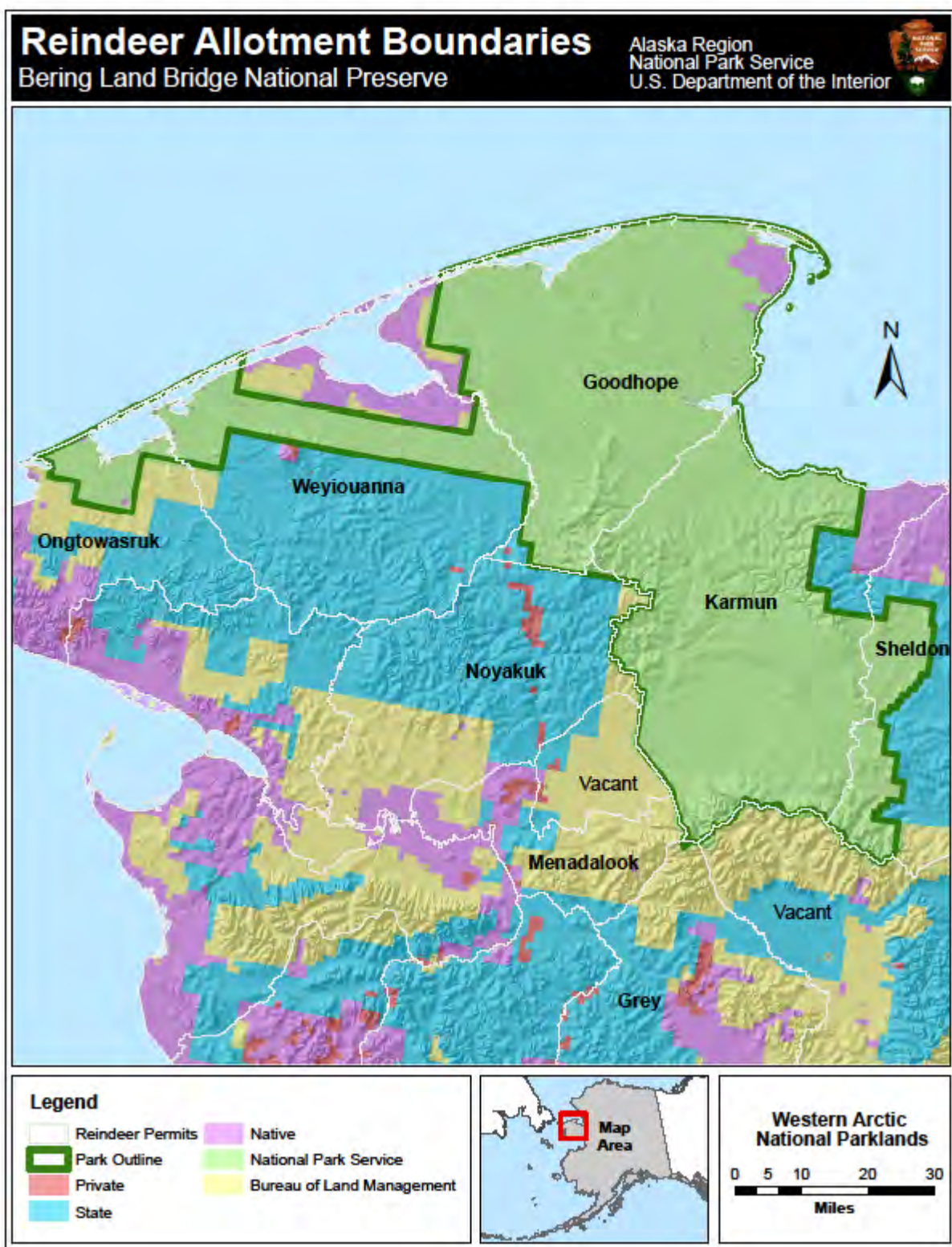


Figure 1-2. Reindeer Grazing Allotments Map

Table 1-1. Reindeer Grazing Allotments in the Preserve.

Allotment Name	Total Acreage	NPS Acreage	Current Permit	Number of Reindeer Authorized	10-yr average herd size
Ongtawasruk	599,151	76,973	yes, NPS	1,000	500
Weyiouanna	1,000,144	254,527	yes, NPS	1,000	500
Goodhope	1,137,229	1,066,596	yes, NPS	1,000	500
Karmun	1,228,796	1,104,652	yes, NPS	3,000	0
Sheldon	1,695,218	171,309	yes, ADNR	2,000	0
Noyakuk	762,018	4,334	yes, BLM	1,000	0
Gray	1,046,757	415	yes, BLM	1,000	
Islands	44,406	19,725	no	0	0
Menadelook	300,969	58	Yes, BLM	1,200	
Vacant	1,059,903	472	no	0	
Totals	8,874,591	2,699,061	4	11,200	1,500

Research in the past 50 years has demonstrated that grazing, including both consumption and trampling, negatively affects lichen communities (e.g., Joly, 2010; Ahti, 1959; Helle and Aspi, 1983). Aside from overall reductions in biomass (Gilbert, 1974) and decreases in relative lichen abundance (Helle and Aspi, 1983), hooves fragment and displace lichens (Pegau, 1969; Cooper et al., 2001). Many arctic grazing studies have examined lichen rangeland management (e.g., Pegau, 1970; Gilbert, 1974; Klein, 1987; Virtala, 1992; Kumpula et al., 2000). NPS studies over the past decade (Holt et al., 2008) suggest that there have been significant reductions in lichen mat height (a proxy for biomass) in areas of known heavy grazing on the Seward Peninsula relative to areas without grazing. However, without better information on vegetation extremes (or “endpoints”) due to grazing in BELA (i.e., areas of heavy grazing and of no grazing), the variability in lichen community structure cannot be characterized for grazing status. The proposal is to characterize the endpoints of grazing status by comparing the vegetation inside and outside of fenced enclosures. Estimating the number of ungulates present at each enclosure site (e.g., via GPS collars) would be useful, though less definitive than paired vegetation plots inside and outside of enclosures because a relatively small subset of animals would be tracked. In addition, grazing impacts from different ungulates (caribou, muskox and moose) may contribute to or mask the effects from reindeer thereby making the evaluation of range condition difficult without the establishment of grazing endpoints for the range.

During the past 20 years, the Western Arctic Caribou Herd (WACH) has numbered over 300,000 animals, and peaked at 490,000 in 2001 (Joly et al. 2010). Most animals have overwintered in eastern BELA and adjacent areas of the Seward Peninsula. Several locations in BELA have experienced heavy localized grazing and trampling from the WACH due to the high numbers of animals, habitat quality and the quantity of forage needed to sustain the herd.

Climate-driven shrub increase in BELA is also of concern, as it is likely to degrade the habitat for terrestrial lichen-based ungulate winter range (Neitlich and Holt 2010, Tape et al. 2006). The proposed enclosures would allow NPS to compare ungulate forage endpoints in grazed versus

ungrazed vegetation, and may help to determine if shrub grazing by caribou is slowing the rate of shrub expansion, thereby preserving lichen winter range habitat.

The main study questions which the enclosures would be used to answer are:

1. How would the community structure of BELA's grazed vegetation compare with that of ungrazed vegetation after 30-50 years without grazing?
2. How would BELA's long-term monitoring plots score on various metrics of grazing impact including estimated lichen biomass, disturbance class and community structure?
3. What would be the trajectory of vegetation succession with and without grazing?

The goals of this project are to accumulate a 30-50 year monitoring record of vegetation data from paired vegetation plots inside and outside the ungulate enclosures. This information would be helpful in the development of a vegetation condition class model, which would be helpful in the development of a BELA reindeer grazing management plan. The grazing management plan will likely describe a desired range condition that would maintain natural species diversity as well as a healthy abundance – quantity and quality – of forage. The desired range condition would not be simply for maximum reindeer yield (as similar grazing plans have specified), but would be for appropriate reindeer yield while maintaining ecological conditions for other NPS resources and values (e.g., lichen biodiversity, caribou and muskox forage).

The NPS is responsible for managing the reindeer grazing on Preserve lands. Grazing permit conditions should be established using the best available scientific information. Currently, NPS has little scientific basis for setting reindeer permit numbers. While the Arctic Network (ARCN) of the NPS Inventory and Monitoring Program has a baseline for vegetation community structure, there are no grazing endpoints around which to base desired condition class. This lack of data could prevent the NPS from accurately assessing grazing impacts.

The intent of this project is to obtain data that would enable NPS to more accurately assess grazing impacts to vegetation, to relate these impacts to endpoints on the grazing spectrum (heavily grazed and ungrazed), and to base permitted reindeer numbers on desired condition classes.

This environmental assessment (EA) analyzes the proposed action and the no-action alternative and their impacts on the environment. This EA has been prepared in accordance with the National Environmental Policy Act (NEPA) of 1969 and regulations of the Council on Environmental Quality (40 CFR 1508.9).

1.2 BACKGROUND

1.2.1 Park Purpose and Significance

Enabling Legislation (edited for brevity, emphasis added)

Alaska National Interest Lands Conservation Act of 1980 (ANILCA)

To provide for the designation and conservation of certain public lands, including the designation of units of the National Park and National Wilderness Preservation Systems.

Sec. 101. (a) In order to preserve for the benefit, use, education, and inspiration of present and future generations certain lands and waters that contain nationally significant natural, scenic, historic, archeological, geological, scientific, wilderness, cultural, recreational, and wildlife values, the units described in the following titles are hereby established.

(b) To preserve unrivaled scenic and geological values associated with natural landscapes; to provide for the maintenance of sound populations of, and habitat for, wildlife species of inestimable value, including those species dependent on vast relatively undeveloped areas; to preserve in their natural state extensive unaltered arctic tundra, and boreal forest ecosystems; to protect the resources related to subsistence needs; to protect and preserve rivers, and lands, and to preserve wilderness resource values and related recreational opportunities; and to maintain opportunities for scientific research and undisturbed ecosystems.

Sec. 201. (2) Bering Land Bridge National Preserve shall be managed for the following purposes, among others: To protect and interpret examples of arctic plant communities; to protect habitat for, and populations of, wildlife; subject to such reasonable regulations as the Secretary may prescribe, to continue reindeer grazing use, including necessary facilities and equipment, in accordance with sound range management practices; to protect the viability of subsistence resources; and to provide for outdoor recreation and environmental education activities.

BELA Foundation Statement 2009 (emphasis added)

Preserve Purpose Statement

The purpose of Bering Land Bridge National Preserve is to protect and provide the opportunity to study and interpret the landscape which contains an invaluable record of floral, faunal, and human migration between Asia and North America and which supports an ongoing traditional subsistence culture.

Preserve Significance Statements

1. Bering Land Bridge National Preserve protects and provides opportunities for the study of paleontological, archeological, and biological resources that reveal a record of migration across the land bridge between Asia and North America.

2. Bering Land Bridge National Preserve protects and interprets, in collaboration with Alaska Natives, thousands of years of use and occupation by the Inupiaq people and their continuing subsistence way of life.
3. Bering Land Bridge National Preserve protects natural resources and native habitats that provide the opportunity for local rural Alaska residents to engage in customary and traditional subsistence uses.
4. Bering Land Bridge National Preserve protects the integrity of the Serpentine Hot Springs, its natural setting, and its cultural and spiritual significance.
5. Bering Land Bridge National Preserve protects and provides opportunities to study and interpret a variety of high latitude volcanic features unique to North America.
6. Bering Land Bridge National Preserve protects reindeer herding habitat to ensure the continued opportunity for reindeer herding by Alaska Natives.

1.2.2 Laws, Regulations and Policies

Laws

The NPS Organic Act of 1916 (16 USC 1, et seq.)

The purpose of units of the National Park System is “to conserve the scenery and the natural and historic objects and the wild life therein and to provide for the enjoyment of the same in such manner and by such means as will leave them unimpaired for the enjoyment of future generations.”

The Reindeer Act of 1937 (5 USC 301; 50 Stat. 900; 25 USC 500-500n)

The Reindeer Act authorizes and directs the Secretary of the Interior to organize and manage the reindeer industry or business in Alaska in such a manner as to establish and maintain a complete and self-sustaining economy for the natives of Alaska, and to encourage and develop Alaska Native activity and responsibility in all branches of the industry or business. To preserve the Native character of the reindeer industry in Alaska, the sale or transfer of Native or government owned reindeer or reindeer products is allowed only under regulations to be developed by the Secretary.

Alaskan reindeer means:

- (1) All reindeer descended from those present in Alaska at the time of passage of the Act; and
- (2) Any caribou introduced into animal husbandry or that has joined a reindeer herd.

The National Park Service Omnibus Management Act of 1998 (aka The Thomas Bill, P.L. 105-391, 112 Statute 3497)

The Thomas Bill addresses resources inventory and management in Title II. Section 201 defines the purposes of the title to enhance and encourage scientific study in NPS units. Section 202 authorizes and directs the Secretary of the Interior to assure management is enhanced in NPS units by a broad program of high quality science and information. Section 205 states the Secretary may solicit, receive, and consider requests from Federal and non-Federal public or private entities for the use of NPS units for scientific study. Such proposals must be: 1) consistent with applicable laws and the NPS Management Policies, and 2) the study would be conducted in a manner as to pose no threat to park resources or public enjoyment of those resources.

Regulations

There are no regulations in place for reindeer grazing management in BELA other than 36 CFR 13.702 regarding permits for off-road vehicle (ORV) use for reindeer grazing.

Policies (edited for brevity, emphasis added)

NPS Management Policies for grazing management:

The Park Service will only allow agricultural grazing in parks where it is specifically authorized by federal law, and does not cause unacceptable impacts on park resources and values. Managers must regulate livestock so that ecosystem dynamics and the composition, condition, and distribution of native plants and animal communities are not significantly altered or otherwise threatened. A comprehensive monitoring program must be implemented, and adaptive management practices must be used to protect park resources. (Management Policies 8.6.8.2)

Appropriate structures may be approved by the NPS and may be allowed in parks when the structures

- are consistent with a livestock management plan or another appropriate management plan;
- are consistent with park purposes and other applicable laws, regulations, or policies; and
- will not cause unacceptable impacts on park resources and values.

(Management Policies 8.6.8.2.2)

NPS Management Policies for wilderness preservation and management:

For the purposes of applying these policies, the term “wilderness” will include the categories of eligible wilderness. The policies apply regardless of category. (Management Policies 6.3.1)

Commercial grazing will be allowed only as specifically authorized by Congress. Where these activities are authorized, they will be managed under conditions and requirements identified within the approved wilderness management plan and corresponding allotment

management plans. The construction of livestock management facilities other than those specifically authorized by legislation is prohibited. All approved livestock use must ensure the preservation of wilderness resources and character. (Management Policies 6.4.7)

NPS Management Policies for scientific activities in wilderness:

Scientific activities are to be encouraged in wilderness. Even those scientific activities that involve a potential impact to wilderness resources or values should be allowed when the benefits of what can be learned outweigh the impacts on wilderness resources and values. However, all such activities must also be evaluated using the minimum requirement concept and include documented compliance that assesses impacts against benefits to wilderness. This process should ensure that the activity is appropriate and uses the minimum tool required to accomplish project objectives. Scientific activities involving prohibitions identified in section 4(c) of the Wilderness Act may be conducted when the following occur:

- The desired information is essential for the understanding, health, management, or administration of wilderness, and the project cannot be reasonably modified to eliminate or reduce the nonconforming uses; or if it increases scientific knowledge, even when this serves no immediate wilderness management purpose, provided it does not compromise wilderness resources or character. The preservation of wilderness and character will be given significantly more weight than economic efficiency and/or convenience.
- The project will not significantly interfere with other wilderness purposes over a broad area or for a long period of time.
- The minimum requirement concept is applied to implementation of the project.

Research and monitoring devices may be installed in wilderness if (1) the desired information is essential for the administration and preservation of wilderness and cannot be obtained from a location outside wilderness without significant loss of precision and applicability; and (2) the proposed device is the minimum requirement necessary to accomplish the research objective safely.
(Management Policies 6.3.6.1)

In every park containing wilderness, the conditions and long-term trends of wilderness resources will be monitored to identify the need for or effects of management actions. The purpose of this monitoring will be to ensure that management actions and visitor impacts on wilderness resources and character do not exceed standards and conditions established in an approved park plan. (Management Policies 6.3.6.2)

1.2.3 Relationship of Proposal to Other Planning Projects

BELA General Management Plan (GMP), 1986

The Preserve's GMP is dated 1986 but it does provide for continued reindeer grazing subject to reasonable regulations on in accordance with sound range management

practices. It states that no priority for the range resources will be given to either reindeer or caribou. (GMP page 104) It also states that the Park Service will initiate research and monitoring activities to determine the impacts of reindeer grazing on tundra and the interaction of reindeer and wildlife. (GMP page 104)

The 1986 GMP does not include land management zoning, so the proposed reindeer grazing enclosures would not be in any specific zone other than National Preserve, eligible wilderness, and permitted reindeer grazing allotments.

Existing permit reindeer herd numbers are the same as those developed in the late 1970s by the Bureau of Land Management when most of the federal land on the Seward Peninsula was managed by that agency.

1.3 ISSUES

To focus the environmental assessment, specific issues have been identified for detailed analysis. Other issues have been eliminated from further evaluation.

An interdisciplinary team of NPS staff conducted project scoping, and included input from public scoping, to clearly define the project design, the project scope, the issues, and the impact topics to be analyzed in this environmental assessment.

1.3.1 Issues and Impact Topics

Issues are the potential environmental effects if the action is taken. Issue statements show the relationship between an action and a resource; they do not predict the degree or intensity of the action. The resource impact topics selected by the interdisciplinary team are as follows:

Wildlife and Habitat

The installation and maintenance of the enclosures, the helicopter access, and the reading of vegetation plots could temporarily displace wildlife in the immediate vicinity. Wildlife habitat could be impacted at the enclosure sites.

Vegetation and Soils

Vegetation could be trampled and soils compacted during installation of enclosures and reading of vegetation plots. Invasive species could be inadvertently transported to enclosure sites on the helicopter, equipment, clothing or footwear.

Visual Quality

The 6' high fence enclosures could be seen by park visitors, thus posing an unnatural visual intrusion in an otherwise natural, treeless, open tundra environment.

Natural Soundscape

Noise intrusions could occur during installation of the enclosures and reading of vegetation plots due to presence of field crews and helicopters used for site access. These noise intrusions could disrupt natural sounds.

Wilderness

Although there is no Congressionally designated wilderness in BELA, all of the Preserve is designated as “eligible wilderness” which is managed to the same standard by NPS Policy. Wilderness character and value could be affected by the long-term (30-50 years) installations. Wilderness character and values could be affected by sights and sounds of helicopters transporting crews or equipment to the sites for enclosure installation and monitoring of vegetation plots.

A Wilderness Minimum Requirement Analysis is attached as Appendix B.

Subsistence

Noise and activity from installation and maintenance of enclosures and monitoring of vegetation plots could disturb subsistence activities or wildlife. Subsistence uses and resources are addressed in detail in the ANILCA Section 810 Evaluation, attached as Appendix A.

Safety

Travelers on snowmachines in winter could crash into grazing enclosures during white-out conditions.

1.3.2 Issues Considered but Dismissed

Issues dismissed from detailed analysis will not be addressed further in the EA.

Cultural Resources

All proposed grazing enclosure sites and alternate sites were visited by a park archeologist for cultural resources evaluation. No historic properties were found in the area of potential effect. Compliance with the National Historic Preservation Act (NHPA) Section 106 would be accomplished by avoidance of any cultural resources.

If previously unknown cultural resources are encountered during the project operations, the appropriate cultural resource personnel or the superintendent will be notified, work at the site would stop, assessments would be made according to the Secretary of the Interior standards as set forth in Section 106 of NHPA. There are 12 alternate sites that could be chosen as replacements in order to avoid encounters with cultural resources.

An *Assessment of Actions Having an Effect on Cultural Resources* has been completed. It documents that the no historic properties would be affected by the project. It has been approved by the superintendent.

Threatened and Endangered Species and Critical Habitat

No federally proposed or listed, threatened or endangered species or critical habitat are known to occur in the project's area of potential effect.

The polar bear is listed as threatened and critical habitat is designated near the BELA coast. The project's area of potential effect is not near the coast or the critical habitat for polar bear.

The yellow-billed loon is a candidate for listing as threatened. There are known nesting grounds near Cape Espenberg in BELA. The project's area of potential effect is not near the coast or Cape Espenberg. The loon requires open water, such as a pond, to take flight. The project's area of potential effect does not include ponds or wetlands.

Floodplains and Wetlands

The area of potential effect is not located in or adjacent to any wetlands or floodplains.

Socioeconomics

Construction activities associated with the installation of enclosures would have a small temporary benefit to the local economy, mostly from the helicopter contract and the crew's lodging and food purchases. No long-term impacts on the local economy would occur as a result of the project.

Environmental Justice

Executive Order 12898, *Environmental Justice in Minority Populations and Low-Income Populations*, requires all federal agencies to incorporate environmental justice into their missions by identifying and addressing disproportionately high and adverse human health or environmental effects of their activities on minorities and low-income populations and communities. The EA alternatives would have no health or environmental effects on minorities or low-income populations or communities.

Migratory Birds

The Migratory Bird Treaty Act prohibits the "take" of migratory birds, their eggs, feathers or nests. In Alaska NPS accomplishes this by clearing vegetation for projects in times other than the nesting season. The enclosure project does not include any vegetation cutting or clearing, and the area of potential effect is treeless tundra. If any nesting birds are observed during project activities, the birds, nest and area would be left undisturbed.

Water Resources

Since this project would not involve ground disturbance and would be located only in upland sites, there would be no impacts to water quality or flow dynamics.

Air Quality

The project would have small temporary effects on air quality from helicopter access of the enclosure sites. No other internal combustion engines would be used for the project. BELA is a Class II (not designated wilderness) air quality area, and has experienced no known exceedances of the National Ambient Air Quality Standards.

Wild and Scenic Rivers

Proposed sites are not located in or adjacent to any designated or proposed wild or scenic rivers.

Climate Change

Research shows that human activities, especially emissions of greenhouse gases into the atmosphere, contribute to changing climate. Greenhouse gas emissions from helicopter operations would be temporary and minimal during construction, thus this project's contribution to climate change would not be measurable.

Climate change would not affect the ability to read the paired vegetation plots inside and outside of the enclosures. Climate driven vegetation change could confuse the vegetation models resulting from this project and the Preserve's description of desired future condition used to manage reindeer grazing.

1.4 PERMITS AND APPROVALS NEEDED TO IMPLEMENT PROJECT

No federal, state, or local permits, licenses, or other consultation requirements have been identified for this grazing enclosure project.

2.0 ALTERNATIVES

2.1 INTRODUCTION

This chapter describes the range of reasonable alternatives, including the proposed action alternative and a No-Action alternative. This chapter also describes those alternatives and actions that will not be considered further (those not analyzed in Chapter 4).

These alternatives were developed by the project leader, an NPS ecologist with the Western Arctic National Parklands (WEAR) and the NPS Arctic Network inventory and monitoring program (ARCN), in consultation with the project's interdisciplinary team of NPS staff members.

Two tables at the end of this chapter compare the alternatives and their environmental impacts.

2.2 ALTERNATIVE A – NO-ACTION

This alternative represents a continuation of the existing situation and provides a baseline for evaluating the changes and impacts of the proposed action.

Grazing enclosure fences would not be installed. The 78 existing winter range vegetation plots (measuring mostly treeless tundra lichen mats) that were installed by ARCN in 2004 would continue to exist, but they would not be paired with new ungulate enclosure plots. ARCN biologists would continue to visit and record vegetation changes at these plots every 10-15 years. Under this alternative, no data would be available on ungrazed ranges in BELA.

2.3 ALTERNATIVE B -- ESTABLISH 18 GRAZING ENCLOSURES (THE NPS PREFERRED ALTERNATIVE)

2.3.1 Proposed Actions

The NPS would construct 18 grazing enclosures in BELA (Figure 2-1, Table 2-1). The enclosures would be placed in six different study strata, with 3 enclosures per stratum. Five of the strata would be landcover classes with significant winter range resources, and the sixth stratum would be a heavily grazed area monitored for recovery. The sample number of 3 enclosures per stratum would be the minimum for a robust statistical sample (Sokal and Rolf, 1995). In compiling within-stratum results, a sample size of 2 would be insufficient for detecting significant differences or trends unless the differences were extremely large. For this reason, NPS has chosen only two project alternatives: The Proposed Action with the minimum statistical sample, and the No-Action. Each of the 15 enclosures proposed for the landcover-based strata would be coupled with an adjacent long-term vegetation plot.

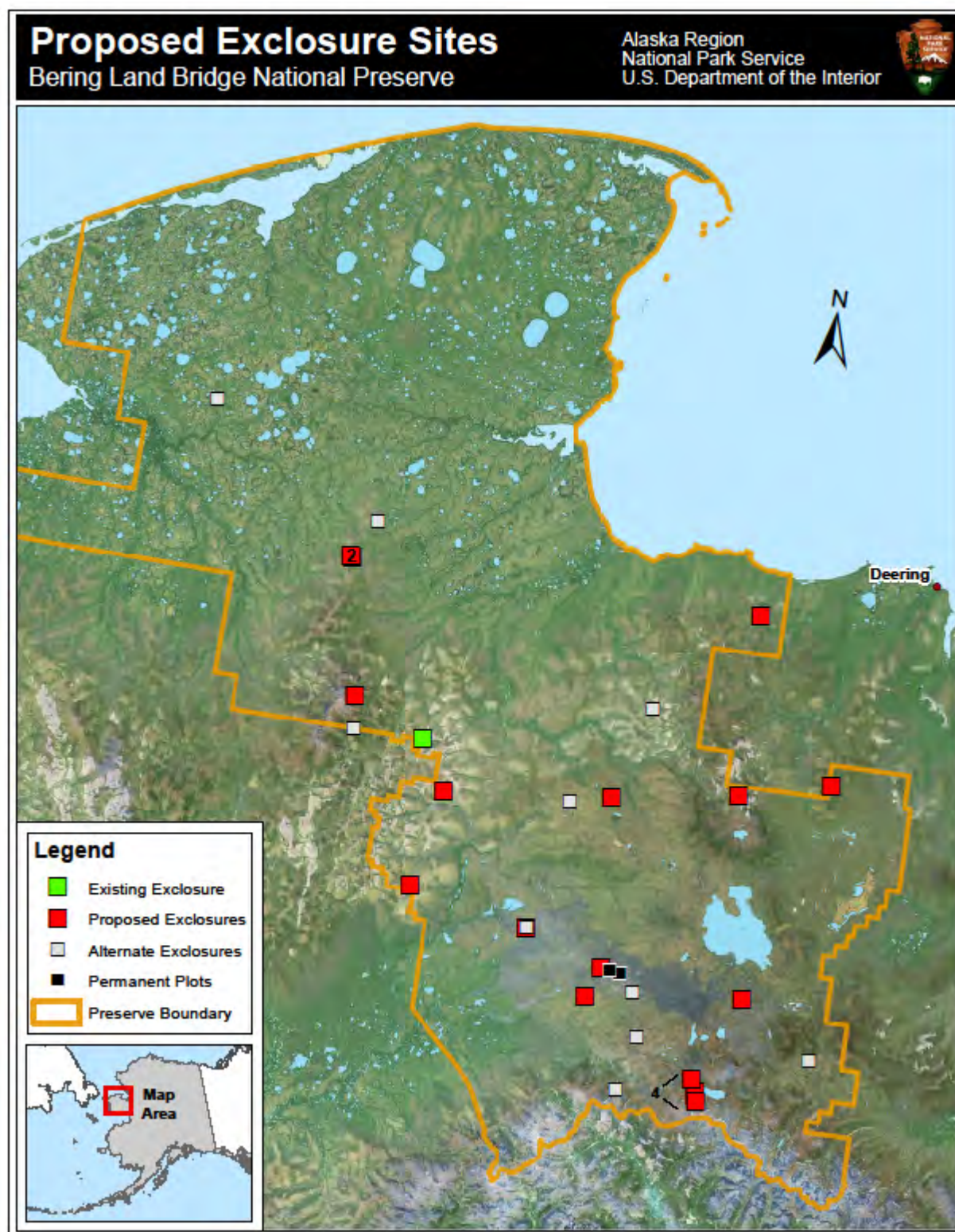


Figure 2-1. Location of Proposed Exclosures and Alternate Sites

The exclosures would be 30 ft x 30 ft free-standing structures with no stakes, sunken posts or guy wires to hold them down (Photo 2-1). They would not be ejected out of the permafrost by frost jacking since they would not be anchored to the ground. As such, they would create no below-ground disturbance, nor would they require holes to be dug. Rather, they would be simply resting upon the ground surface. The exclosures would be constructed of 10 ft x 6 ft standard fencing panels (i.e., chain link fence attached to a 10 ft x 6 ft rectangle made of 2" in galvanized steel pipe) clamped together in the field using hand tools. Clear reflectors would be placed on exclosures to improve winter visibility for snowmachine safety.



Photo 2-1. Example of a Grazing Exclosure

Table 2-1. Exclosure Site Characteristics

Exclosure Number	Plot	Type	Latitude ¹	Longitude ¹	% Cover Lichen	Slope (Deg)	Elev (Ft)	Exclosure Stratum ²	Aggregated Ecotype ³	Map Ecotype ³
1	10L-b	Exclosure	66.006739	-163.265451	35	2	620	Upland Moist Dwarf Birch Tussock and Ericaceous Shrub Tundras	Upland Dwarf Birch-Tussock Shrub	Upland Moist Dwarf Birch-Tussock Shrub
2	12S-b	Exclosure	65.826693	-164.498001	40	2	1649	Alpine Nonalkaline dry Dryas Shrub and Barrens	Alpine and Upland Dwarf Shrub and Barrens	Alpine Nonalkaline Dry Barrens
3	15L	Exclosure	66.001546	-164.575233	30	4	708	Upland Moist Sedge-Dryas Meadow	Upland and Lowland Sedge-Dryas Meadow	Upland Moist Sedge-Dryas Meadow
4	15S-Alt	Exclosure	66.004625	-164.581617	70	6	800	Alpine Nonalkaline dry Dryas Shrub and Barrens	Alpine and Upland Dwarf Shrub and Barrens	Alpine Nonalkaline Dry Barrens
5	3L	Exclosure	65.484256	-163.643857	25	0	687	Upland Moist Sedge-Dryas Meadow	Upland and Lowland Sedge-Dryas Meadow	Upland Moist Sedge-Dryas Meadow
6	3S-c pot- 2	Exclosure	65.561719	-163.856945	55	1	422	Upland Dry Lichen Barrens	Upland Dry Lichen Barrens	Upland Dry Lichen Barrens
7	4L Pot	Exclosure	65.509727	-163.156449	40	1	1306	Upland Moist Dwarf Birch Tussock and Ericaceous Shrub Tundras	Upland Dwarf Birch-Tussock Shrub	Upland Moist Dwarf Birch-Tussock Shrub
8	5S	Exclosure	65.800391	-162.969722	30	6	1284	Alpine Nonalkaline dry Dryas Shrub and Barrens	Alpine and Upland Dwarf Shrub and Barrens	Alpine Nonalkaline Dry Barrens
9	5S-b	Exclosure	65.770211	-163.254926	43	9	1904	Alpine Alkaline Dry Dryas Shrub and Barrens	Alpine and Upland Dwarf Shrub and Barrens	Alpine Alkaline Dry Dryas Shrub
10	7S-b pot	Exclosure	65.524167	-163.606201	75	0	801	Upland Dry Lichen Barrens	3	Upland Dry Lichen Barrens
11	8L	Exclosure	65.593282	-164.234142	52	9	837	Alpine Alkaline	Upland and	Upland Alkaline

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Exclosure Number	Plot	Type	Latitude ¹	Longitude ¹	% Cover Lichen	Slope (Deg)	Elev (Ft)	Exclosure Stratum ²	Aggregated Ecotype ³	Map Ecotype ³
								Dry Dryas Shrub and Barrens	Lowland Dwarf Birch-Willow Shrub	Outwash/ Upland Moist Dwarf Birch-Ericaceous Shrub
12	8S	Exclosure	65.720151	-164.175879	45	3	1013	Alpine Alkaline Dry Dryas Shrub and Barrens	Alpine and Upland Dwarf Shrub and Barrens	Alpine Alkaline Dry Dryas Shrub
13	9M pot	Exclosure	65.744721	-163.651436	32	2	936	Upland Moist Sedge-Dryas Meadow	Upland and Lowland Sedge-Dryas Meadow	Upland Moist Sedge-Dryas Meadow
14	Kutz 15	Exclosure	65.378830	-163.260410	>25	3	1650	Kuzitrin Recovery Site	Alpine and Upland Dwarf Shrub and Barrens	Alpine Nonalkaline Dry Dryas Shrub
15	KUTZ-4 Pot	Exclosure	65.382253	-163.260412	>25	3	1575	Kuzitrin Recovery Site	Alpine and Upland Dwarf Shrub and Barrens	Alpine Nonalkaline Dry Dryas Shrub
16	KUTZ-7 & 8	Exclosure	65.399145	-163.277478	>25	2	1400	Upland Dry Lichen Barrens	Upland Dry Lichen Barrens	Upland Dry Lichen Barrens
17	Kuz Pot Exc 2, Kutz13	Exclosure	65.369927	-163.256057	>25	2	1820	Kuzitrin Recovery Site	Alpine and Upland Dwarf Shrub and Barrens	Alpine Nonalkaline Dry Dryas Shrub
18	11L	Existing Exclosure	65.784953	-164.266441	25	4	778	Upland Moist Sedge-Dryas Meadow	Upland and Lowland Sedge-Dryas Meadow	Upland Moist Sedge-Dryas Meadow
A1	12L	Alternate	65.783762	-164.486007	30	3	1376	Upland Moist Dwarf Birch Tussock and Ericaceous Shrub Tundras	Upland Dwarf Birch-Tussock Shrub	Upland Moist Dwarf Birch-Tussock Shrub
A2	15P pot	Alternate	66.053153	-164.513061	37	3	355	Upland Moist Dwarf Birch Tussock and Ericaceous Shrub Tundras	Upland Dwarf Birch-Tussock Shrub	Upland Moist Dwarf Birch-Tussock Shrub
A3	18M	Alternate	66.176813	-165.081645	27	2	96	Upland Moist Dwarf Birch Tussock and	Upland Dwarf Birch-Tussock Shrub	Upland Moist Dwarf Birch-Tussock Shrub

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Environmental Assessment
Grazing Exclosures

Exclosure Number	Plot	Type	Latitude ¹	Longitude ¹	% Cover Lichen	Slope (Deg)	Elev (Ft)	Exclosure Stratum ²	Aggregated Ecotype ³	Map Ecotype ³
								Ericaceous Shrub Tundras		
A4	1L Pot	Alternate	65.370566	-163.506779	45	9	1465	Alpine Nonalkaline dry Dryas Shrub and Barrens	Alpine and Upland Dwarf Shrub and Barrens	Alpine Nonalkaline Dry Dryas Shrub
A5	2M	Alternate	65.443550	-162.923706	35	2	1116	Upland Moist Dwarf Birch Tussock and Ericaceous Shrub Tundras	Upland Dwarf Birch-Tussock Shrub	Upland Moist Dwarf Birch-Tussock Shrub
A6	3S-c pot	Alternate	65.562811	-163.853637	55	1	422	Upland Dry Lichen Barrens	Upland Dry Lichen Barrens	Upland Dry Lichen Barrens
A7	4P	Alternate	65.498911	-163.496931	21	1	966	Upland Moist Dwarf Birch Tussock and Ericaceous Shrub Tundras	Upland Dwarf Birch-Tussock Shrub	Upland Moist Dwarf Birch-Tussock Shrub
A8	9L-b	Alternate	65.733578	-163.738818	40	2	874	Upland Moist Dwarf Birch Tussock and Ericaceous Shrub Tundras	Upland Dwarf Birch-Tussock Shrub	Upland Moist Dwarf Birch-Tussock Shrub
A9	D	Alternate	65.866030	-163.560190	>25	50	926	Upland Moist Sedge-Dryas Meadow	Upland and Lowland Sedge-Dryas Meadow	Upland Moist Sedge-Dryas Meadow
A10	J	Alternate	65.442190	-163.465410	>25	60	1166	Upland Moist Dwarf Birch Tussock and Ericaceous Shrub Tundras	Upland Dwarf Birch-Tussock Shrub	Upland Moist Dwarf Birch-Tussock Shrub

1. Coordinates are in Geographic Coordinate System-North American Datum 1983 (GCS_NAD83)
2. Exclosure Stratum are derived from Jorgenson et al. 2004
3. Aggregated Ecotype and Map Ecotype are from Jorgenson et al. 2004

Access to the enclosure sites for construction, maintenance, monitoring and removal would be by helicopter (Photo 2-1). The helicopter would sling load bundles of 6 panels at a time. There would be at least 2 trips to each site to deliver the materials. Helicopter, fuel and material staging would be outside of the Preserve, probably at the Nome airport.

Vegetation plots would be established so that two would be inside the enclosure and two would be outside the enclosure but nearby in the same vegetation type.

Every 10 years the enclosures and co-located vegetation plots would be revisited and surveyed by NPS ARCN biologists to record vegetation data. In the deployment year (proposed for summer 2012), a baseline of conditions inside and outside the enclosures would be obtained. In successive years, data would allow for several important analyses:

1. Comparison of vegetation structure inside versus outside the enclosures both within and among strata
2. Trends in recovery within the heavily grazed stratum
3. Determination of the relationship between the vegetation structure in enclosures versus the long-term lichen monitoring plots
4. Determination of upper and lower bounds for vegetation desired condition classes for a variety of measures (e.g., abundance of lichen forage, biodiversity, successional status)
5. Assessment of the condition classes of BELA's vegetation in long-term monitoring plots based on the parameters of the desired condition classes, as derived from enclosures.

Access would be by helicopter.

2.3.2 Mitigation Measures

Below is a listing of mitigation measures that would be followed to avoid, minimize, or eliminate adverse impacts. These measures are integrated into the proposed action, and the impact analysis in Chapter 4 assumes these measures would be part of the project.

1. Cultural Resources – If previously unknown cultural resources are encountered, the work shall stop, the appropriate cultural resource personnel or the superintendent shall be notified, assessments shall be made and action taken according to the Secretary of the Interior standards as set forth in NHPA Section 106.
2. Wildlife, Subsistence and Sport Hunting – To the extent possible, installation and maintenance activities shall be timed to avoid sensitive time periods, such as nesting season, times of caribou migration, and times of subsistence activities involving wildlife. Whenever feasible, helicopter flights shall maintain at least a 1,500 foot vertical and horizontal distance from big game animals, traditional summer habitats, calving grounds, and other habitats supporting wildlife reproduction. This shall include brown bear, moose, caribou, wolves and wolverines. Helicopters shall not hover over, circle, harass, or pursue wildlife in any way. Use of helicopters during sport hunting season in areas of known sport hunting shall be avoided.

3. Wildlife –Helicopter activity shall be scheduled to avoid nesting season and periods of sensitive bird migration in the project areas. Known seabird colony areas shall be avoided.
4. Soils and Archeology – The enclosures shall not be secured or affixed to the ground other than by their own weight. There shall be no ground disturbance other than pounding in up to 5 vegetation plot markers per site (18 sites total), (5 X 18) or 90 marker stakes total for the project.
5. Visitor Information – A signs shall be posted on each of the 18 enclosures briefly stating its purpose and an office to contact. The signs shall remain affixed to the enclosures for the duration of the 30-50 year project.
6. Natural Quiet – To reduce adverse noise impacts to wildlife and recreational users, helicopters shall maintain a minimum altitude of 2,000 to 2,500 feet above ground, other than during the initial phase of slinging the fencing material into the site, during landing and takeoff, or when visibility is limited by cloud cover, pursuant to Federal Aviation Administration (FAA) Advisory Circular (AC91-36C), “Visual Flight Rules (VFR) Near Noise Sensitive Areas.”

2.4 ENVIRONMENTALLY PREFERABLE ALTERNATIVE

The environmentally preferable alternative is Alternative A, the No-Action alternative. It would have no additional impact to the biophysical and wilderness resources. Grazing enclosures however, would provide valuable range condition measures, which would not occur under the No Action alternative.

2.5 ALTERNATIVES AND ACTIONS CONSIDERED BUT REJECTED

The following project alternatives were considered but eliminated during the project scoping process, and they will not be analyzed further in this EA. The rationale for eliminating these alternatives is based primarily on factors relating to whether the alternative is reasonable or feasible.

2.5.1 Locate Enclosures Outside the Preserve

To be able to compare a vegetation plot with no grazing to plots that are grazed, enclosures need to be collocated in the vicinity of the existing permanent vegetation monitoring plots within the landcovers of management interest. In addition, the size of the Preserve (2.7 million acres) makes extrapolation of study results from outside the Preserve to situations within the Preserve problematic due the potentially high degree of environmental variability between study sites.

2.5.2 Establish Fewer than 18 Fence Enclosures

There are 5 principal vegetation types in the Preserve used for winter forage. The investigators propose to study each of these 5 types, plus an area showing heavy grazing in order to observe vegetation recovery. In order to have quantitative data appropriate for range management decisions, a minimum of 3 enclosures per vegetation type is required. This minimum number of 3 enclosures per vegetation type is needed for statistical analysis in order to evaluate grazing impacts to each vegetation type. A number fewer than 6 (vegetation types) times 3 (enclosures), or 18, does not meet standard statistical practices for monitoring. A smaller number would not provide the rigor necessary to achieve scientific credibility. A sample size of 2 enclosures per vegetation type would not provide the statistical power needed to gain insight into the grazing phenomenon, and would therefore not meet the objectives of the proposed action.

2.5.3 Establish More than 18 Fence Enclosures

Six winter forage strata have been identified for this study. All 6 must be studied in order to have the data necessary for proper range management. A larger number of replicate samples would yield a larger statistical accuracy for the study. If there were no other considerations such as cost or wilderness impacts, more enclosures (e.g., 4-6 replicates per stratum) would be desirable for more accurate forage information for proper range management. In order to reduce wilderness impacts and hold down costs, the minimum number of enclosures is proposed here for a statistically reasonable project. Initial project draft concepts had more enclosures, but these were eliminated in favor of the present 18. The project design is for each enclosure to be paired with an existing permanent vegetation plot. The existing NPS ARKN plots were established in 2004. If more than 18 enclosures were established, then some would be in new sites that currently have no vegetation plots, and the vegetation monitoring record would begin at the time of plot establishment. This would not have the same advantage as the existing 7 years of vegetation data that the existing plots have.

2.5.3 Use Remote Sensing to Monitor Vegetation Condition

Remote sensing (satellite or aerial imaging) of vegetation condition does not currently have the resolution to be able to assess lichen abundance and diversity on the ground, and is limited to very coarse vegetation structure (e.g., forest versus shrubs versus wetlands of different types).

2.5.5 End Reindeer Grazing in the Preserve

Reindeer grazing is a continuing activity that is authorized by ANILCA, the 1980 enabling legislation of the Preserve. Section 201(2) of ANILCA directs the NPS to manage the Preserve “to continue reindeer grazing use.” Closing the Preserve to reindeer grazing use would likely require additional legislation.

Table 2-2 Summary of Alternative Impacts.

Impact Topic	Alternative A: No Action	Alternative B: 18 Enclosures
Wildlife, Habitat, and Species of Special Concern	No direct effects on wildlife and habitat. <i>Minor cumulative impacts</i>	Minor, direct, adverse impacts to wildlife from displacement of wildlife and disturbance during installation, monitoring and maintenance of the enclosures. <i>Minor cumulative impacts</i>
Vegetation and Soils	No direct effects on vegetation and soils. <i>Moderate cumulative impacts</i>	Minor, local, direct, adverse impacts on vegetation and soils over the 30 to 50-year life of the project from vegetation trampling and soil compaction. <i>Moderate cumulative impacts</i>
Visual Quality	No impacts to visual quality <i>Minor cumulative impacts</i>	Minor, long-term, direct, local, adverse impacts on visual quality from 6-foot high enclosure fences visible at 18 sites in a large expanse of natural treeless tundra landscape. <i>Minor cumulative impacts</i>
Natural Soundscape	No new impacts to the natural soundscape would occur. <i>Minor cumulative impacts</i>	Minor, temporary, direct, park-wide, adverse impacts on the natural soundscape from noise intrusions by helicopters during installation, maintenance, and removal of enclosures, and monitoring of paired vegetation plots. <i>Minor cumulative impacts</i>
Wilderness	No additional impacts to eligible wilderness <i>Moderate cumulative impacts</i>	Moderate, long-term, direct, park-wide, adverse impacts to wilderness characters from the presence of the enclosures and helicopter use for installation, maintenance, monitoring, and removal. <i>Moderate cumulative impacts</i>

Impact Topic	Alternative A: No Action	Alternative B: 18 Enclosures
Subsistence	No impacts to subsistence <i>Minor cumulative impacts</i>	Minor, temporary, direct, park-wide, adverse impacts to subsistence wildlife resources from helicopter noise. <i>Minor cumulative impacts</i>
Safety	No impacts to safety <i>Minor cumulative impacts</i>	Minor, long-term, direct, local, adverse impacts on safety from the risk of snowmachine and helicopter accidents. <i>Minor cumulative impacts</i>

3.0 AFFECTED ENVIRONMENT

3.1 PROJECT AREA

BELA is located on the Seward Peninsula in Northwestern Alaska about 500 miles northwest of Anchorage (see Figure 1-1). The Preserve contains approximately 2,697,391 acres. The peninsula is the divide between the Pacific and Arctic oceans, with the Norton Sound and Bering Sea to the south and Kotzebue Sound and Chukchi Sea to the north. The climate of the Seward Peninsula shows both maritime and continental influences and is strongly affected by whether or not the surrounding maritime waters are frozen over or are ice-free (generally mid-June to early November). Temperatures of the Seward Peninsula are tempered by the oceanic influence of the surrounding Bering and Chukchi seas. Mean July temperatures in nearby Nome and Kotzebue are 51° F and 54° F, respectively (Holt et al., 2008). Mean annual precipitation is 17.5 inches in Nome and 11.4 inches in Kotzebue. When offshore waters are frozen, both inland and coastal climates are more continental (i.e., drier, clearer, less windy); however, peninsula temperature do not reach the extreme lows that are seen in interior Alaska at the same latitude (NPS, 1986).

The Seward Peninsula consists of a mixture of coastal plain, rolling uplands, and mountain range. Most of the Preserve is covered with moist to wet tussock tundra underlain by continuous permafrost (Holt et al., 2008). Rising south from sea level, the Preserve's southern boundary follows the crest of the Bendeleben Mountains to 3,400 feet elevation.

Landownership on the Seward Peninsula is a mosaic of state, federal, native regional, native village, and private lands. Landownership of BELA is primarily federal (2,651,182 acres, including 18,660 acres of selections by native corporations and individuals), with 46,209 acres of nonfederal land (NPS AKRO Lands Office, email July 20, 2011).

3.2 WILDLIFE, HABITAT, AND SPECIES OF SPECIAL CONCERN

Mammals living in the Bering Land Bridge National Preserve include the muskox, reindeer, caribou, grizzly bear, polar bear, wolf, wolverine, foxes, and smaller species. Although muskox originally ranged over the Seward Peninsula, they were eliminated in the early 1890s. They were reintroduced on the peninsula in the 1960's, and although the main herds are concentrated outside the Preserve, individuals or small groups range widely throughout the peninsula, including the Preserve.

The subject of the BELA enclosure study – the lichens, grasses, sedges, forbs and woody plants, such as willows – are grazed by reindeer, caribou and muskox. There are 6 grazing allotments for reindeer on BELA (Figure 2-1, Reindeer Grazing Allotments). All of the grazing allotments have substantial acreage outside the Preserve. All have been permitted since 1978 but without a scientific basis for determining sustainable reindeer numbers. Some localized grazing areas have been observed as overgrazed, showing closely cropped or trampled lichens and denuded soils

from clusters of hoof prints. Other grazing habitats have been degraded in value by fire (Figure 3-1) and may take decades to recover.

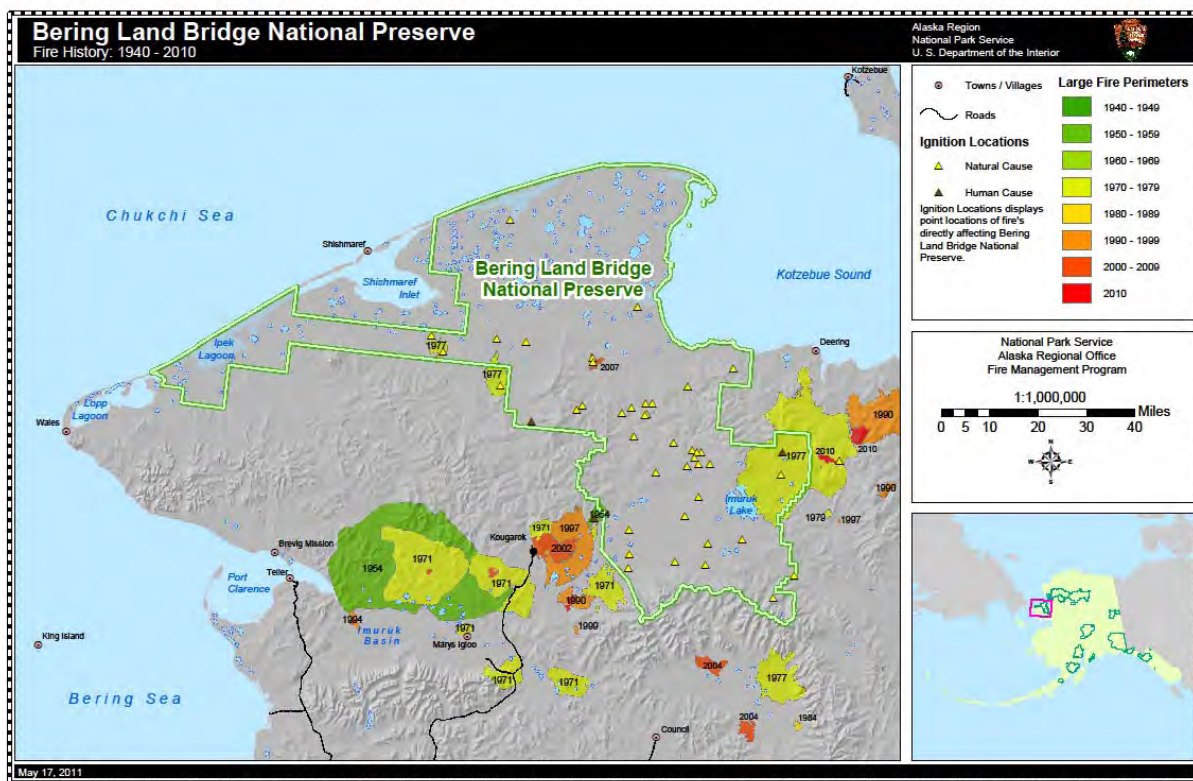


Figure 3-1. BELA Fire History 1940-2010

Moose on the Seward Peninsula have large home ranges, and they may frequently move into and out of the Preserve. Within the Preserve, moose occur in all the major drainages, but not generally along the coast.

Brown bears occur throughout the Seward Peninsula and in the Preserve (NPS, 1986). Brown bears typically use the river valleys and coastal areas in spring and the coastal lowlands in summer and fall where salmon streams are located. Black bears are not found in the Preserve. Wolves occur on the tundra and in the eastern part of the peninsula within spruce forests.

Smaller mammals on the Preserve include red and arctic fox, muskrats, arctic ground squirrel, short-tailed and least weasels, and wolverine. The Preserve does not include marine waters off its shores, but it does include several small islands southeast of Cape Espenberg which are important seal haulouts. Marine mammals include ringed, bearded, and spotted seals, Stellar sea lion, walrus, bowhead whale, finback whale, beluga whale, and harbor porpoise. Polar bears are found along the Chukchi Sea coast in winter where they move into the area with pack ice.

The Seward Peninsula is a diverse area for birds, with at least 170 known to occur, of which approximately 108 species are found on the Preserve (NPS, 1986). This diversity is related in part to the Preserve's nearness to Asia and also to the occurrence of three distinct habitats – marine-estuarine, tundra, and boreal forest (which is mainly miles off and not in the Preserve). Some Asian birds regularly migrate across the Bering Strait and breed on the peninsula. The salty grasslands and marshes at the mouths of the Nugnugaluktuk, Pish, and Goodhope rivers and Cape Espenberg are especially important for waterfowl. Colonies of seabirds are found in the Preserve, as well as pelagic seabirds and gulls found in the waters immediately off the Chukchi Sea coast. The tundra habitat supports the majority of passerine birds, as well as hawks, owls, and other predatory birds. Relatively few boreal forest birds are found in the Preserve, but species such as varied thrush, American robin, and warblers may occur along the eastern boundary.

Fish species found in the Preserve include nine-spined stickleback, grayling, arctic char, Dolly Varden and chum salmon (NPS, 1986). Salmon runs occur in the lower parts of the Arctic and Serpentine rivers in the Preserve and also in the Inmachuk.

3.3 VEGETATION AND SOILS

Based on Nowacki et al. (2002) descriptions of the ecoregions of Alaska, the Preserve is located in the Bering Tundra Division – Kotzebue Sound Lowlands and Seward Peninsula Ecoregions. Ecoregions are large ecosystems primarily defined by climate and topography, with refinements from vegetation patterns, disturbance regimes, bedrock geology, and surficial deposits remaining from recent geomorphic activities such as glaciers, floods, and volcanic eruptions. Other than exposed volcanic features and some bare ridges of exposed bedrock, most of BELA is covered by an unconsolidated layer of sediment, including gravels, sand, and silt (NPS, 1986).

The Bering Tundra Division includes lands and nearby waters in and near the sea. The Chukchi Sea has limited warming effects on the climate, so the adjacent lands are predominately cold, wind-swept, and treeless (Spencer et al., 2002). The cold soils and bitter climate support moist or wet tundra communities of sedges, grasses, low shrubs, and lichens interspersed with rocky cliffs and shorelines. Drier ridge tops on the Seward Peninsula and the islands have alpine *Dryas*-lichen tundra and barrens with low shrub tundra on hillsides and willows along streams. Scattered forest patches of balsam poplar and white spruce grow along the rivers in protected valleys of the easternmost Seward Peninsula and the Kotzebue lowlands, close to the Preserve.

The general vegetation types present in northwest Alaska are *Eriophorum* tussock tundra, *Dryas* fell-field, ericaceous shrub tundra, and *Eriophorum*-*Carex* wet meadow (Holt et al., 2008). Common shrubs consist of *Salix* spp., *Betula glandulosa*, and *Alnus crispa*. The herb layer contains mixed *Eriophorum* spp., *Carex* spp., *Vaccinium* spp., *Arctostaphylus* spp., *Empetrum nigrum*, *Cassiope tetragona*, *Ledum pelustre* var. *decumbens*, and *Rubus chamaemorus*. The dominant mosses are *Sphagnum* spp. and *Hylocomium splendens*. The lichen flora is dominated by species of *Cladina*, *Cladonia*, *Cetraria*, *Peltigera*, and *Stereocaulon*.

The vegetation of BELA is a mosaic of dwarf shrub tundras, alpine barrens, wet, graminoid-dominated lowland tundras and riparian willow thickets (Neitlich, 2010). Over 350 vascular plants (Parker et al., 2004) and 149 macrolichens have been collected from the Preserve. There is likely to be a similar number of crustose lichens, although currently only 18 species have been documented (Holt and Neitlich, 2010). Brackish/salt marsh grasslands occur in estuaries and around lagoons with drier grasslands on sandy seashore dunes. Wet tundra is common throughout the coastal lowlands with moist tundra (tussock grass with some shrubs around thaw and maar lakes) on drier hills and slopes. Moist tundra predominates throughout the uplands of the plateau and foothills generally as tussock grass but with shrubs in patches and thickets along river courses. Alpine tundra predominates in the mountainous areas. Willow, alder and dwarf birch make up some of the more noticeable shrub thickets.

Lichens are among the more sensitive elements of this low-arctic tundra and have co-evolved with the native caribou (*Rangifer tarandus*) and muskox (*Ovibos moschatus*) that depend on them for winter range forage. Lichens are extremely slow-growing and easily killed by excessive browsing or trampling (Helle and Aspi, 1983; Holt et al., 2008). In this treeless lowland and alpine landscape, lichen-dominated communities represent more than 40% of the plant species in the Preserve (Neitlich, 2010). Lichens represent approximately 40% of the species in this landscape (including several rare Beringian and/or circumpolar species) and a sizeable portion of the biomass. All the non-vascular species combined probably account for 20-40% of the biomass.

The 18 enclosures proposed by this project would be constructed in the landcover classes described in Table 3-1 and shown in Figure 3-2.

Surface features of the Preserve are influenced by the existence of a continuous permafrost layer. The depth of the seasonally thawed active layer varies from 1 to 10 feet, depending on the type of surface (e.g., under a lake, gravel bar, or vegetated soil), while the perennially frozen layer below may be 15 to over 600 feet thick (NPS, 1986).

**Table 3-1. Proposed Enclosure Locations by Landcover Class
as Defined by Jorgenson (2004).**

Landcover Class	Number of Enclosures
Upland Moist Dwarf Birch Tussock and Ericaceous Shrub Tundras	3
Upland Moist Sedge-Dryas Meadow	3
Alpine Alkaline Dry Dryas Shrub and Barrens	3
Alpine Nonalkaline Dry Dryas Shrub and Barrens	3
Upland Dry Lichen Barrens	3
Kuzitrin Lake Intensive Grazing Recovery Sites (on Landcover Types above)	3

Soils in BELA are typical peaty and loamy surface layers of arctic tundra over permafrost, with some areas having very shallow or no soil development (NPS, 1986). Interspersed are frequent

areas of frost-boil soil patches and the solifluction lobes. Shallow, gravelly, mineral soils occur on most ridges where the depth to bedrock is too shallow to support permafrost. Virtually all tundra soil types are rated as having medium to high erosion potential if they are disturbed by roads, structures, or other activities such as grazing.

Fire plays an important part in vegetation management through the periodic removal of vegetation, recycling of nutrients, and returning area to earlier stages of succession (NPS, 1986). There are designated appropriate fire suppression categories for the Preserve, but much of BELA is in a limited-action fire management category. In these areas, fire will be allowed to burn unimpeded, provided that there is no threat to private property or adjoining areas within a higher fire suppression category. Most if not all of the exclosures proposed by this project would be located in the limited-action fire management category, and vegetation in the exclosures would likely be allowed to burn.

3.4 VISUAL QUALITY

All exclosure sites would be located on tundra with low growing vegetation, with views that allow for long-range visibility, depending on topographic view breaks (Lawler, 2011). The exclosures could possibly be seen by people traveling cross country between villages or for subsistence activities, but they would not likely be seen by backcountry recreationists as access to the sites is difficult. Pilots and passengers flying to villages or conducting survey work would not likely be able to see the exclosures from the air as they would blend in with the landscape.

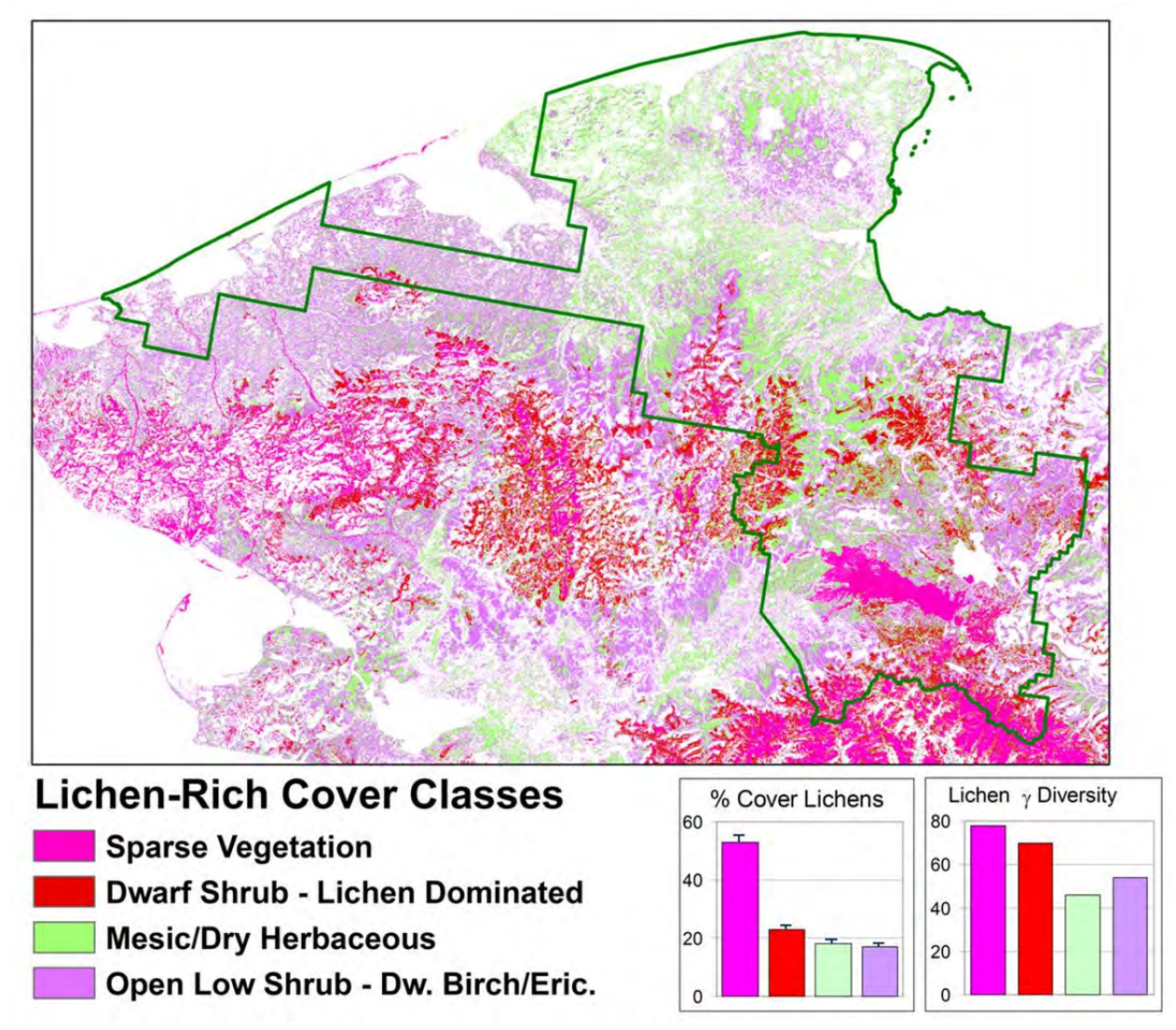


Figure 3-1. Landcover Classes in Bering Land Bridge National Preserve.

3.5 NATURAL SOUNDSCAPE

The ambient sounds at the proposed enclosure sites consist predominantly of natural sounds, including common wind on the open tundra and the calling of birds such as geese, loons, and sandhill cranes occupying nearby wetlands (Lawler, 2011). On this natural background can occasionally be heard the sounds of low level local fixed-wing aircraft transporting people to and from villages and bringing visitors to the backcountry; snowmachines traveling between villages or cross country for subsistence activities; and occasional year round access by helicopter for research and NPS operations support. Table 3-2 compares decibel levels of sounds that may be heard near the enclosures. Actual noise levels at any particular site depend on the type of

airplane or helicopter, wind direction and speed, whether an airplane or helicopter is approaching or departing, landing or taking off, flying at different altitudes, turbine or gas-powered.

Table 3-2. Decibel Levels of Ambient and Human-Induced Sounds.

Source	Decibels (dBA)
Rainfall	50
Normal Conversation	60
Wind	35-85
Shouting	90
Airplanes (overhead)	100
Helicopter (at site)	105
Helicopter (5 seconds away)	95
Helicopter (10 seconds away)	85
Helicopter (15 seconds away)	80

(Data derived from: ASHA, no date; Hamilton, 2003; Miller, 2002; UCSC, no date).

3.6 WILDERNESS

Alaska's national parks contain the largest areas of undeveloped wilderness lands in the United States. They encompass some of the best examples of the wide diversity of ecosystems in Alaska including mountain summits, rolling tundra, massive ice fields, beaches, boreal forest and coastal rainforest on a scale not possible elsewhere in the country. Their size and scope give them a national and international recognition as wilderness resources. They also protect significant wildlife habitat, archeological resources, and opportunities for subsistence and recreational activities. The Wilderness Act of 1964 (P.L. 88-577) describes wilderness as an area "untrammelled by man...retaining its primeval character and influence, without permanent improvements or human habitation... [with] outstanding opportunities for solitude or a primitive and unconfined type of recreation."

No lands were designated as wilderness in BELA under the enabling legislation (ANILCA, sec. 701). However, all but 94,781 acres (of the 2,697,391 total) of the Preserve are eligible for designation as wilderness (NPS, 1986). Eligible lands meet the criteria for designation found in the Wilderness Act of 1964 based on the wilderness suitability reviews conducted in compliance with ANILCA section 1317(a) and included in the Preserve's General Management Plans (NPS, 1986). The full wilderness review process required under ANILCA section 1317(b) has not yet been completed on these eligible lands. Although an EIS was drafted with a full wilderness review, there was no approval by the Secretary of the Interior's office, and no record of decision published in the Federal Register. This leaves the eligible wilderness acreage to be managed as wilderness under NPS Management Policies (2006).

Lands in the Preserve that are not eligible for wilderness designation comprise 94,781 acres. Most of this acreage was left out of eligible wilderness at the time due to pending native land selections which have since been resolved. Some of the non-eligible acreage may have been due to unpatented mining claims at the time. The Preserve currently has no more mining claims in

private ownership. NPS is managing eligible wilderness to maintain the wilderness character and values of the lands until a final decision has been made.

The 4 statutory qualities of wilderness character, as adapted from Landres et al. (2008a and 2008b), are considered in this EA:

- **Untrammeled** – Wilderness is essentially unhindered and free from modern human control or manipulation. This quality is degraded by modern human activities or actions that control or manipulate the components or processes of ecological systems inside the wilderness.
- **Natural** – Wilderness ecological systems are substantially free from the effects of modern civilization. This quality is degraded by intended or unintended effects of modern people on the ecological systems inside the wilderness since the area was designated.
- **Undeveloped** – Wilderness retains its primeval character and influence, and is essentially without permanent improvement or modern human occupation. This quality is degraded by the presence of structures, installations, habitations, and by the use of motor vehicles, motorized equipment, or mechanical transport that increases people's ability to occupy or modify the environment.
- **Solitude or Primitive and Unconfined Recreation** – Wilderness provides outstanding opportunities for solitude or primitive and unconfined recreation. This quality is degraded by settings that reduce these opportunities, such as visitor encounters, signs of modern civilization, recreation facilities, and management restrictions on visitor behavior.

3.7 SUBSISTENCE

Many residents of villages on the Seward Peninsula rely heavily on subsistence hunting, fishing, and gathering to meet food needs. Subsistence activities also provide clothing, and furs and skins for customary trade. Resources harvested include land mammals (caribou and moose), marine mammals (polar bear, bowhead whale, beluga whale, walrus, bearded seal, and several smaller seals), waterfowl, fish, and plants (greens and berries). While subsistence hunting takes place year-round, it is most intense during wildlife migration periods, spring through fall (NPS, 1986).

There is extensive subsistence use in the Preserve by residents of Shishmaref, with selected areas being used by residents of Kotzebue, Deering, Wales, and Nome (NPS, 1986). Most subsistence use occurs along the coast and along major rivers in chosen allotments (Adkisson, 2011). Residents of Kotzebue and Deering use the Cape Espenberg area, and those from Deering use the Goodhope Bay coast as well. People from Wales use the westernmost area of the Preserve, along the Ikpek and Arctic lagoons, plus some inland areas. Subsistence users from Nome extend into the Preserve along the Kuzitrin River and into the Serpentine Hot Springs valley (NPS, 1986).

At BELA, access for subsistence uses includes snowmachine, motorboat and dog team, all of which are authorized by regulation (36 CFR 13.460). Although ORVs are used in and near villages adjacent to the Preserve and along the northwest coast, ORVs are not permitted in BELA for subsistence uses (NPS, 1986).

BELA contains 104 Native Allotments (167 parcels) as private inholdings. These sites were basically selected for supporting subsistence activities and their locations reflect usage patterns. The sites are predominately located along the sea coast, around the shores of inlets, and adjacent to navigable river, although there are a smaller number scattered through the interior of the Preserve. They serve as camps for spring bird hunting, bases for spring marine mammal hunting, and later in the harvest cycle for harvesting birds and eggs, fishing, and gathering berries and greens, or as bases for winter hunting and trapping.

Seasonal use of the Preserve is largely a function of viable transportation. Winter and spring see larger areas of the Preserve (especially inland) used when snowmachine access is possible. Summer and fall access is largely by boat and so use is limited to coastal and riparian areas accessed by navigable rivers and streams.

3.7 SAFETY

Current safety risks at BELA include the inherent dangers associated with helicopter use, light airplane use and snowmachine travel. NPS personnel and researchers use helicopters to access research and monitoring sites and backcountry installations that require maintenance, and there is always a risk of crashing associated with helicopter use.

Cross country snowmachine travel can pose risks to the safety of riders associated with crashing, frostbite, hypothermia and getting lost. The population of Shishmaref is 563, of Deering is 122, and of Wales is 145 (DCED, 2011). There is the potential for any of these residents, along with visitors from other locations, to be at risk of snowmachine accidents.

4.0 ENVIRONMENTAL CONSEQUENCES

4.1 INTRODUCTION

This chapter provides an evaluation of the potential effects or impacts of each of the alternatives on the resources described in the issue statements presented in Chapter 1, Purpose and Need for Action. The chapter is organized by alternative. The information is based on readily available environmental information, information from NPS resource specialists, and field reconnaissance.

4.2 METHODOLOGY

For each issue selected for detailed analysis (see section 1.3.1) and for which the subject resources are described in Chapter 3, the direct, indirect, and cumulative effects are analyzed. The effects to the subject resources are analyzed on the basis of type (adverse or beneficial), context, duration, and intensity of the impacts. Summary impact levels (characterized as negligible, minor, moderate, or major) are given for each issue topic in the analyses. Definitions of impact terms are provided below.

Overall, the NPS based the following impact analyses and conclusions on the review of existing literature and Bering Land Bridge National Preserve studies, information provided by experts within the NPS and other agencies, professional judgments and park staff insights, and public input.

Context of Impact

Context is the setting within which an impact is analyzed, such as local, park-wide, or regional. CEQ requires that impact analyses include discussions of context. Localized impacts are those that affect the resource area only on the project site or its immediate surroundings, and would not extend park-wide or into the region.

Duration of Impact

Temporary impacts would occur only during the time that project activities are being conducted. In the interim between these activities, resource conditions would return to pre-activity conditions. Short-term impacts would extend beyond the time of project activities, but would not last more than one to two years. Long-term impacts would extend for several years or beyond the life of the project even if the actions causing the impacts were to cease; they could potentially continue indefinitely, in which case they could also be described as permanent.

Intensity of Impact

Impact intensity is the degree to which a resource would be beneficially or adversely affected by an action. Impact intensities are quantified as negligible, minor, moderate, or major. Table 4-1 presents a summary of impact level thresholds.

Table 4-1 Summary Impact Levels

Negligible	Minor	Moderate	Major
Minimal impact on the resource would occur; any change that might occur would be barely perceptible and not be easily measurable.	Change in a resource would occur, but no substantial resource impact would result; the change in the resource would be detectable but would not alter the condition or appearance of the resource.	Noticeable change in a resource would occur and this change would alter the condition or appearance of the resource, but the integrity of the resource would remain intact.	Substantial impact or change in a resource area would occur that is easily defined and highly noticeable and that measurably alters the condition or appearance of the resource; the integrity of the resource may not remain intact.

Direct versus Indirect Impacts

Direct effects are impacts caused by the alternative(s) at the same time and in the same location as the action. Indirect effects are impacts caused by the alternative(s) that occur later in time or farther in distance than the action, but still reasonably foreseeable. An indirect impact could occur because of a change to another resource or impact topic.

4.2.1 Cumulative Impacts

CEQ regulations (40 CFR 1508.7) require the assessment of cumulative impacts in the decision-making process for Federal projects. A cumulative impact is an impact on the environment that results from the incremental impact of the action when added to other past, present, and reasonably foreseeable future actions regardless of which agency (Federal or non-Federal), organization, or person undertakes such other actions. Cumulative impacts can result from individually minor, but collectively significant, actions taking place over a period of time.

Cumulative impacts are considered for all alternatives and are presented at the end of each impact topic discussion analysis. To determine potential cumulative impacts, projects in the vicinity of the proposed project site were identified. Potential projects identified as cumulative actions included any planning or development activity that was currently being implemented or that would be implemented in the reasonably foreseeable future.

Known past, present and reasonably foreseeable future projects and actions include human installations located in the eligible wilderness and non-eligible wilderness areas of BELA. The

predominant human installations in the Preserve are the facilities, trails, and air strip associated with the Serpentine Hot Springs. There are five remote automated weather stations (RAWS), four of which are being installed in the summer of 2012, and one NPS radio repeater. There are also cabins used for emergency shelters along winter cross country travel routes.

The 78 vegetation monitoring plots do not have any stakes marking them (they are relocated using GPS and plot photos) and are accessed by helicopter once every 10 years for reading. It takes 1-2 years to monitor all the plots, the last time being in 2004.

Muskox composition surveys and the associated helicopter access have occurred annually, but after 2012, it will be every other year (Lawler, 2011). The surveys occur in mid-late March, and sometimes into April. First the muskox are located by fixed-wing aircraft, then helicopters are used to land so that researchers can collect data. A survey typically consists of 2-3 days of flying with a variable number of landings but with an approximate range of 15-20 landings. The survey takes place throughout BELA and since the animals move, the places where helicopters land vary from one survey to the next.

Lake research is conducted mostly by outside researchers as 2-3 year projects. Lake monitoring utilizes fixed-wing aircraft and helicopters. The amount of flying associated with lake work varies from project to project.

Archeologists use helicopters on occasion to conduct cultural assessments, but also not on a regular schedule.

4.3 ALTERNATIVE A: NO ACTION

4.3.1 Wildlife and Habitat

Under the No Action Alternative, grazing enclosure fences would not be installed. The 78 existing winter range vegetation plots that were installed by ARCN in 2004 would continue to exist, but they would not be paired with new ungulate enclosure plots. ARCN biologists would continue to visit and record vegetation changes at these open plots every 10-15 years.

Because new actions would not be undertaken, no direct impacts to wildlife in terms of direct habitat effects or disturbance from installation or monitoring activities would occur as a result of this alternative.

Cumulative Impacts

Wildlife habitat in the Preserve is mostly untouched and unmanaged. Wildlife habitat in parts of the Preserve has been locally cleared for construction of cabins, an air strip, and corrals. Besides the actual footprint of facilities, habitat in the immediate surrounding areas has been impacted by trampling from pedestrians, livestock and vehicle traffic. The backcountry installations in the Preserve, including radio repeaters and weather stations, impact small areas of wildlife habitat. Park visitation in the backcountry, and the presence of field crews maintaining monitoring

stations, could cause localized, temporary displacement of wildlife and disturbance of wildlife habitat. Subsistence and sport hunting also contribute to the disturbance, and loss, of wildlife. These actions have resulted in long and short-term habitat loss, displacement of wildlife, and increased human-wildlife conflicts.

The cumulative impact on wildlife and habitat from human installations would be minor. The No Action alternative would not contribute direct adverse cumulative impacts on wildlife and habitat in BELA. However, continued grazing by reindeer could be an indirect, minor adverse effect of the No Action alternative.

Conclusion

The No Action Alternative would not have direct adverse effects on wildlife and habitat in BELA.

4.3.2 Vegetation and Soils

Under the No Action Alternative, no enclosures would be installed. No direct impacts to vegetation or soils would occur as a result of this alternative.

Cumulative Impacts

Research in the past 50 years has demonstrated that reindeer impacts, including both grazing consumption and trampling, negatively affect lichen communities in arctic and subarctic environments (e.g., Ahti 1959, Helle and Aspi 1983). Aside from overall reductions in biomass (Gilbert 1974) and decreases in relative lichen abundance (Helle and Aspi 1983), hooves fragment and displace lichens (Pegau 1969, Cooper et al. 2001). Lichen rangeland management, aiming to maintain adequate forage and monitor recovery to gauge grazing rotation periods, is the center of many arctic grazing studies (e.g., Pegau 1970, Gilbert 1974, Klein 1987, Virtala 1992, Kumpula et al. 2000).

NPS's studies over the past decade (Holt et al. 2008) concluded that there were significant reductions in lichen mat height, a proxy for biomass, in areas of known heavy grazing on the Seward Peninsula relative to areas of known absence of grazing or intermediate areas. Also, in the absence of known grazing extremes (or "endpoints") in BELA (i.e., areas of heavy grazing and no grazing), there was not enough variability in lichen community structure to characterize the grazing status of vegetation. The only way to be able to characterize grazing status is to fence certain areas from grazing and score other sites relative to those no-grazing endpoints.

NPS would like to develop a grazing management plan in which the numbers of reindeer are based on the desired condition of the resource, according to the best available science. Under the No Action Alternative, such a plan would not be possible and vegetation and soils could potentially be impacted.

The largest past and present human impact on vegetation and soils at BELA has been from reindeer herding without the guidance of a grazing management plan. Other impacts include

small areas of vegetation in parts of the park have been cleared for construction of cabins, an air strip, and corrals. Besides the actual footprint of such facilities, plants in the immediate surrounding areas have been impacted by trampling from pedestrian and off-road vehicle traffic. There may also be dispersed vegetation impacts caused by off-trail pedestrian travel.

Tundra fires have a long-term and strongly negative impact to lichen mats in the Preserve. Fires in the Preserve are almost entirely caused by summer lightning and are a natural part of ecosystem dynamics.

Backcountry installations such as radio repeaters and weather stations impact very small areas of vegetation and soils. The area of vegetation trampling from foot traffic and helicopter landings during reading of the 78 vegetation monitoring plots, lake research, and muskox composition work would continue, but the impacts to vegetation and soil would be limited to the area immediately surrounding the sites.

The cumulative impact on vegetation and soils from such actions would be adverse and moderate. This alternative would not contribute to cumulative impacts on vegetation and soils.

Conclusion

The No Action Alternative would not have direct effects on vegetation and soils.

4.3.3 Visual Quality

Under the No Action Alternative, no enclosures would be installed, and there would be no new impacts on visual quality.

Cumulative Impacts

Visual quality is affected by the presence and operation of human installations in the Preserve, such as the marked trails, air strip at Serpentine Hot Springs, weather stations, radio repeater, corrals, and cabins. However, these facilities are relatively few when compared to other areas of the U.S. and they do not occupy much space in comparison to the acreage of the BELA's natural landscape. Research and monitoring sites either do not contain markers that would affect visual quality, or they are small – half-inch diameter reinforcement bar stakes, 24 inches high, and some with wooden lath markers three feet high. The cumulative impact on visual quality from the presence of human installations would be minor adverse. The No Action Alternative would not contribute cumulative impacts on visual quality.

Conclusion

The No Action Alternative would not contribute impacts on visual quality.

4.3.4 Natural Soundscape

Under the No Action Alternative, no enclosures would be installed, thus there would be no impact on the natural soundscape of the Preserve.

Cumulative Impacts

Cumulative effects to the natural soundscape at BELA include the irregular overflights of small planes bringing people and goods to and from villages, small planes bringing hunters or backpackers to the backcountry, helicopters bringing government staff and researchers into the backcountry, and snowmachines in winter. Aircraft noise disturbances are more frequent during the summer months than other times of year. Helicopters are used to access vegetation monitoring plots every 10 years, muskox monitoring every two years, lake research, occasional archeological surveys, weather stations, and one NPS radio repeater for maintenance. These helicopter flights are direct from an airport in Nome or Kotzebue to the field sites. Noise intrusions are temporary and of 1 to 30 minutes duration, although spread throughout the Preserve. Snowmachine noise is occasional throughout the winter from cross country travelers.

Past, present, and future noise disturbance in the Preserve has minor adverse cumulative impacts on the natural soundscape. The No Action Alternative would not contribute cumulative impacts to the natural soundscape.

Conclusion

The No Action Alternative would not contribute impacts to the natural soundscape.

4.3.5 Wilderness

Under the No Action Alternative, no enclosures would be installed, and there would be no new impacts on areas eligible for wilderness designation.

Cumulative Impacts

There are five weather stations, one NPS radio repeater, reindeer corrals, and shelter cabins located in eligible wilderness at BELA. These human developments are relatively small when compared to the acreage of the Preserve. The cumulative effects on the wilderness resources and values of BELA are moderate adverse. This alternative would not contribute cumulative impacts on wilderness since no enclosures would be installed.

Conclusion

The No Action Alternative would result in no additional impacts to eligible wilderness.

4.3.6 Subsistence

Under the No Action Alternative, no enclosures would be installed, thus there would be no new impacts on subsistence.

Cumulative Impacts

Emergency cabins and winter snowmachine trails in the backcountry benefit subsistence users by providing emergency shelter and guidance. Research and monitoring being conducted on vegetation and lakes may lead to improved management of subsistence resources. The administrative restrictions placed on low flying agency or contract aircraft conducting fire reconnaissance along the coast reduce the risk of disturbing marine wildlife near subsistence camps. Low flying agency or contract aircraft over inland subsistence hunters and aircraft landing near inland subsistence camps could disturb wildlife and adversely affect inland subsistence activities. Overall, these actions have minor cumulative impacts on subsistence. This alternative would not contribute cumulative impacts on subsistence.

Conclusion

The No Action Alternative would not have adverse impacts on subsistence in the Preserve.

4.3.7 Safety

Under the No Action Alternative, enclosures would not be installed at BELA, thus there would be no impacts on safety.

Cumulative Impacts

There are past and continuing safety risks for park staff and researchers using helicopters to access research and monitoring plots, archeological survey sites, weather stations, and other backcountry installations. There are also inherent safety risks associated with cross country snowmachine travel through the Preserve in winter. Such activities have minor adverse cumulative impacts on safety. NPS-maintained emergency cabins mitigate this winter safety risk somewhat. This alternative would not contribute cumulative effects on safety since no enclosures would be installed.

Conclusion

The No Action Alternative would not have adverse impacts to safety in the Preserve.

4.4 ALTERNATIVE B: ESTABLISH 18 GRAZING ENCLOSURES (The NPS Preferred Alternative)

4.4.1 Wildlife, Habitat, and Species of Special Concern

Under Alternative B, installation of 18 enclosures would damage and likely eliminate all vegetation immediately beneath the perimeter fencing panels and would likely alter the composition of vegetation within the enclosures to the extent that it had been subject to grazing prior to enclosure installation. Enclosure installation activities would temporarily displace wildlife on and in the immediate vicinity of the 18 sites. Disturbance would be temporary as installation would require no more than one half day at any one site. Wildlife would be disturbed temporarily by helicopters accessing the sites and by the presence of people on the ground. It is documented that wildlife startle responses to helicopters include fleeing, cessation of foraging, and disruption of bedding (Cote, 1996; Larkin, 1996; Frid, 1999a and 1999b). Frid (1999c) found that activity disruptions occurred when the helicopter was a median distance of 1 km away. Helicopter disturbance during installation would be minor as there would be two to three round-trip flights at each site. Disturbance from monitoring and maintenance activities on wildlife would be minor as each site would be visited only once every 10 years.

The enclosures would have a combined footprint of about 16,200 square feet, or about 0.37 acre. There would also be localized habitat disturbance from foot traffic during installation, monitoring and maintenance; however, this area would likely be minimal and limited to the area immediately surrounding the enclosures. Additionally, localized habitat disturbance from helicopter landings would occur. Foot traffic and landing zones at each new site would comprise an area of about 360 square feet or about 0.008 acre. The maximum direct impacts to wildlife habitat from the installation of 18 enclosures at BELA, including the enclosure footprint (0.37 acres) and foot traffic and landing zones (1.68 acres), would be about 2.05 acres. This compares to the total acreage of BELA of at 2,697,391 acres. Thus, direct adverse habitat effects would be minor. Certain indirect effects would be beneficial to the degree the data from the study may be useful to the NPS in refining grazing allotment permits to reduce effects of overgrazing.

Mammals such as Dall sheep, coyote, gray wolf, red fox, lynx, muskox, brown bear, black bear, and wolverine and birds including ptarmigan, grouse, raptors, and waterfowl may occur at the proposed sites, but tend to move over large areas of habitat. The Arctic ground squirrel, Alaskan marmot, and various hares, voles, and shrews are likely to inhabit underground burrows at the proposed sites. Moose occur mostly in the vicinity of small water bodies, wetlands, and riverine areas and are not likely to frequent the enclosure sites. Caribou migrate through the Preserve from wintering grounds to calving areas and summer range. The Western Arctic Caribou Herd numbers on the order of hundreds of thousands and seasonally occupies the eastern half of the Preserve during winter and the coastal areas during calving. However, it is unlikely that wildlife species would be susceptible to high levels of disturbance from the installation and maintenance of the enclosures as these sites were selected so as not to be located within sensitive bird nesting, mammal or bird breeding, or ungulate foraging areas.

Cumulative Impacts

Overall, wildlife habitat at BELA is mostly undisturbed. Wildlife habitat in parts of BELA has been cleared for construction of emergency cabins and an air strip. Besides the actual footprint of facilities, habitat in the immediate surrounding areas has been impacted by trampling from pedestrian and vehicle traffic. The predominant human installations in the Preserve are the facilities, trails, and air strip associated with the Serpentine Hot Springs. There are five weather stations and one NPS radio repeater. Visitation in the backcountry, and the presence of field crews maintaining monitoring stations, could cause localized, temporary displacement of wildlife and disturbance of wildlife habitat. The area of wildlife habitat disturbed by foot traffic and helicopter landings during maintenance activities would be minimal and limited to the area immediately surrounding the enclosures. Subsistence and sport hunting also contribute to the disturbance, and loss, of wildlife. These actions have resulted in long and short-term habitat loss, displacement of wildlife, and human-wildlife conflicts.

Combined with known past, current and future projects and actions, there would be minor adverse cumulative impacts on wildlife. This alternative would contribute minor adverse cumulative impacts on wildlife and habitat at BELA.

Conclusion

Alternative B would result in minor, direct, local impacts to wildlife and wildlife habitat from displacement of wildlife and disturbance of wildlife habitat during installation and during monitoring and maintenance of the enclosures.

4.4.2 Vegetation and Soils

Under Alternative B, 18 enclosures would be installed in the Preserve. Enclosures each would have a footprint of 900 square feet (0.02 acre), or 120 linear feet, and would be free-standing structures with no stakes, sunken posts or guy wires to hold them down; they would not be anchored to the ground. As such, they would create no below-ground disturbance to soils, nor would they require holes or trenches to be dug. Direct adverse impacts on vegetation would result from the 120 linear feet of fencing at each site. The fencing would cover lichens and other low growing plants. These plants would likely be destroyed, but the narrow impact areas would recover within a few years once the fences were removed after the 30 to 50-year study. Vegetation clearing would not be needed as all sites have low growing plants.

There would be localized vegetation trampling and soil compaction from foot traffic during installation, maintenance, and removal of enclosures and reading of monitoring plots both inside and outside the fence; however, the area trampled and compacted would likely be minimal and limited to the area immediately inside and outside of the enclosures. Localized compaction of any existing vegetation and soils from helicopter landings would occur; however, these effects are not typically discernible to the eye and vegetation under the runners tends to remain alive and healthy.

Foot traffic, landing zones, and enclosures at each site would comprise an area of no more than 5,000 square feet (about 0.11 acre). The maximum direct impacts to vegetation and soils in the Preserve from the 18 enclosures and monitoring of paired plots, including the fence footprints, foot traffic, and landing zones, would be about 2.05 acres.

Exotic plants or seeds could be transported to the sites on equipment, clothing and footwear. New introductions could allow for exotic plants to become established and spread, especially in areas where the ground is disturbed by installation activities. However, best management practices to ensure that equipment, clothing and footwear do not contain exotic plant material would be implemented.

Adverse direct impacts on vegetation and soils, although long-term, would be minimal since very little trampling and destruction of plants would occur, especially when compared to thousands of acres of vegetation and soils in the Preserve.

Cumulative Impacts

The largest past and present impact on vegetation and soils at BELA has been from reindeer herding without the guidance of a grazing management plan. Other impacts include small areas of vegetation that have been cleared for construction of emergency cabins, other buildings and an air strip. Besides the actual footprint of such facilities, plants in the immediate surrounding areas have been impacted by trampling from pedestrian and off-road vehicle traffic. There may also be dispersed vegetation impacts caused by off-trail pedestrian traffic.

Backcountry installations such as a radio repeater and weather stations impact small areas of vegetation and soils. The area of vegetation trampling from foot traffic and helicopter landings during reading of the 78 vegetation monitoring plots, fire vegetation plots, lake research, and muskox composition work would continue however they are minimal and are limited to the areas immediately surrounding the sites.

Tundra fires have a long-term and strongly negative impact to lichen mats in the Preserve. Fires in the Preserve are almost entirely caused by summer lightning and are a natural part of ecosystem dynamics.

The cumulative impact on vegetation and soils from such actions would be adverse and moderate. This alternative would contribute minor cumulative impacts on vegetation and soils. Combined with known past, current and future projects and actions, there would be moderate cumulative impacts on vegetation and soils.

Conclusion

Alternative B would result in minor, local, direct, adverse impacts on vegetation and soils over the 30 to 50-year life of the project from placement of the enclosures, vegetation trampling and soil compaction.

4.4.3 Visual Quality

Under Alternative B, 18 new enclosures would be installed at BELA. The visual quality at each site would be adversely affected by the enclosure fences which would provide visual intrusions on the long-range visibility of the natural landscape around the sites.

Three enclosures, which would be located approximately 2 miles away from winter snowmachine routes, could possibly be seen by people traveling cross country between villages or for subsistence activities if off the established routes. The site closest to Serpentine Hot Springs is 5.7 miles away on the other side of a major ridge system, so it would not be visible from the hot springs area. It could possibly be seen by backcountry hikers. All the other sites would not likely be seen by backcountry recreationists as access to the sites is difficult. Two-inch reflectors placed on or near the corner fence posts of the enclosures would be intended to make the fences more visible to winter snowmachine travelers. Although this measure would be beneficial for safety reasons, as discussed below, it would increase the adverse effects on visual quality.

Another effect on the visual quality surrounding the project sites may be attributed to differences in the appearance of vegetation inside vs. outside of the enclosures as the project progresses. As reindeer and other ungulates would not be able to graze inside the fences, vegetation would recover and possibly be altered in color, size, density and other attributes, creating a 900 square foot area of contrasting appearance with vegetation outside the enclosure at each site.

The visual quality of the enclosure sites would be returned to natural conditions upon completion of the project, in 30 to 50 years, when the fences are removed. A line on the ground bare of vegetation would show for a few years where fences were placed, until the vegetation recovers and covers the lines.

Cumulative Impacts

Visual quality is affected by the presence and operation of human installations in the Preserve, such as the trail markings, an air strip at Serpentine Hot Springs, weather stations, a radio repeater, corrals, and emergency cabins. However, these facilities do not occupy much space in comparison to the area of the natural landscape. The existing research and monitoring sites either do not contain markers that would affect visual quality, or they are small and unobtrusive. These facilities have a minor impact on the visual quality of the Preserve. This alternative would contribute minor cumulative impacts on visual quality. Combined with known past, current and future projects and actions, there would be minor adverse cumulative impacts on visual quality.

Conclusion

The impact of Alternative B on the visual quality of the Preserve would be minor, long-term, direct, local, and adverse because the 18 enclosures would be 6-feet high in the large expanse of treeless natural landscape, so would be visible.

4.4.4 Natural Soundscape

Under Alternative B, the natural soundscape would be affected by activities associated with installing 18 enclosure in the Preserve. Helicopters, which would be required for installation of the enclosure fences, would intrude upon the natural soundscape for one day at each site, with two or three round-trip flights that day, for a total of 36 to 54 helicopter trips for enclosure installation.

Subsequent to enclosure installation, site visits would be conducted every ten years for monitoring of paired vegetation plots at all sites. Each site would likely require one round-trip helicopter flight every ten years. Maintenance of enclosures would likely occur during these trips, but could require additional trips in between monitoring years. At the completion of the project, helicopters would be used to remove the enclosures. Each of the helicopter trips during the life of the project would create temporary noise intrusions on the natural soundscape.

Natural sounds predominate at all the proposed sites, despite occasional noise from overflights, helicopter use for other projects, and snowmachines in winter. Since helicopter-produced sound can be heard at long distances (see Table 3-2 for sound levels of helicopters at various distances), the natural soundscape would be diminished. However, these intrusions on the natural soundscape would be minimal as they would be temporary and of short duration, and would occur very few days each year when trips are made.

Cumulative Impacts

Cumulative effects to the natural soundscape at BELA include the irregular overflights of small planes bringing goods and people to and from villages, small planes bringing visitors to the backcountry, helicopters bringing NPS staff and researchers into the backcountry, and snowmachines in winter. Aircraft noise disturbances are more frequent during the summer months than other times of year. Helicopters are used to access vegetation monitoring plots every 10 years, muskox monitoring every two years, lake research, occasional archeological surveys, weather stations, and one NPS repeater for maintenance. These helicopter flights would be direct from the airports of Nome or Kotzebue to the sites and of limited duration, thus noise intrusions would be temporary and of short duration, although spread throughout the Preserve. Snowmachine noise would be occasional throughout the winter from cross country travelers, mostly along the established winter routes.

These activities would have minor adverse cumulative impacts on the natural soundscape. Alternative B would contribute minor cumulative impacts on the natural soundscape. Combined with known past, current and future projects and actions, there would be minor adverse cumulative impacts on soundscape.

Conclusion

Alternative B would result in minor, temporary, direct, park-wide, adverse impacts on the natural soundscape over the course of the project from noise intrusions by helicopters during installation, maintenance, and removal of enclosures, and monitoring of paired vegetation plots.

4.4.5 Wilderness

Under Alternative B, 18 enclosures would be installed in BELA on previously undisturbed sites in eligible wilderness. The four qualities of wilderness character (described in Section 3.6) – untrammeled, natural, undeveloped, and solitude or primitive and unconfined recreation – would experience some impacts from helicopter use to install, maintain, and remove the enclosures and monitor the paired vegetation plots, and from the presence of enclosure fences which would remain in the eligible wilderness for the 30 to 50 year duration of the project. A Minimum Requirements Analysis for this project is included in the appendix.

For the life of the project, the undeveloped quality of wilderness would be diminished by the installation and long-term presence of the 18 facilities. The footprint of the long-term enclosures would be small (0.11 acre at each site), but the presence of the enclosures would affect the intrinsic value of large, undeveloped wilderness landscapes over the long-term.

The untrammeled character of the wilderness would be adversely affected for the course of the project as the fences would serve as human control, or manipulation, to exclude grazing inside them. Additionally, the enclosures would have small footprints compared to the large expanse of untrammeled landscape.

The solitude or primitive and unconfined recreation value of wilderness would be adversely impacted by the installation of the enclosures. A wilderness experience is partly dependent on a wilderness setting without facilities or where “the imprint of man’s work (is) substantially unnoticeable” (Wilderness Act Sec. 2(c)(1)).

Ecosystem processes would continue unchanged from current conditions outside the enclosures; but without ungulate grazing pressure inside the enclosures. The naturalness of the wilderness would be affected during the life of the project, with beneficial consequences in the long-term.

At the end of the project, the enclosure fences would be removed. Wilderness characters that were adversely affected by the project (undeveloped and solitude) would be restored, and the untrammeled and natural wilderness characters would be improved by future, scientifically based grazing management.

Cumulative Impacts

There are five weather stations, one NPS radio repeater, an airstrip, winter route markers, reindeer corrals, and emergency shelter cabins located in eligible wilderness at BELA. These human developments are relatively small compared to the size of the Preserve. The cumulative effects on the resources and values of wilderness are moderate adverse. This alternative would contribute moderate adverse cumulative impacts from the installation of 18 enclosures in eligible wilderness. Combined with known past, current and future projects and actions, there would be moderate adverse cumulative impacts on wilderness.

Conclusion

During the 30 to 50-year life of the project, Alternative B would have moderate, long-term, direct, park-wide, adverse impacts to wilderness characters from the presence of the enclosures and visits via helicopter for installation, maintenance, monitoring, and removal.

4.4.6 Subsistence

As most of the 18 grazing enclosure sites proposed under this alternative would be located inland away from coastal and riverine areas, adverse impacts on subsistence use would be minimal. The enclosure sites would be relatively small and widely dispersed. Habitat that would be disturbed would be small at each site. The sites are not expected to alter patterns of behavior of large mammals such as caribou, moose, or muskox important for subsistence.

There could be some disturbance of subsistence wildlife moving away during installation, maintenance, and removal of enclosure fences and reading of paired vegetation plots from helicopter noise. However, such disturbance would be infrequent and of short duration, and wildlife would likely return soon after noise and project activities cease. In some cases, and of greater effect, project noise and activity could possibly affect caribou in the immediate area during migration which may result in a change in migration route. However, to the extent possible, installation and maintenance activities would be timed to avoid sensitive periods, such as caribou migration and subsistence activities involving wildlife.

Cumulative Impacts

Emergency cabins in the backcountry benefit subsistence users by providing emergency shelter when needed during travel cross country in winter. Research and monitoring being conducted on vegetation and lakes may lead to improvement of subsistence resources. The restrictions placed on low level aircraft flying reconnaissance along the coast for the fire program would reduce the risk of disturbing marine wildlife near subsistence camps. However, low flying aircraft over inland subsistence hunters and aircraft landing near inland subsistence camps could disturb wildlife and adversely affect inland subsistence activities. These actions have minor cumulative impacts on subsistence. Alternative B would contribute minor adverse cumulative impacts on subsistence. Combined with known past, current and future projects and actions, there would be minor cumulative impacts on subsistence.

Conclusion

Alternative B would result in minor, temporary, direct, park-wide, adverse impacts to subsistence from disturbance of subsistence wildlife during installation, maintenance, and removal of enclosure fences and reading of paired vegetation plots from helicopter noise.

4.4.7 Safety

The installation of 18 grazing enclosures in the Preserve could pose safety risks in winter to cross-country snowmachine travel between villages or engaged in subsistence use. The chain-

link enclosure fences would blend in with the landscape, especially as hoar frost builds up on them. Poor visibility and the high rate of travel could lead to snowmachines crashing into the enclosure fences. However, placing two inch reflectors the top corner the enclosures would improve night visibility of enclosures with the intent of reducing accidents. Snowmachines mainly use the established travel routes, and three of the enclosures are located near these routes (see Figure 2-1). The danger of crashing into the enclosures would be a safety concern for residents of nearby villages using the Preserve; however, this risk is likely to be low (Adkisson, 2011).

There would also be a safety concern for NPS personnel and researchers associated with helicopter use to access the sites. However, the risk of crashing a helicopter would be low as the sites are located in flat areas with wide open landscapes.

Once the project is completed and enclosures are removed, the safety concerns associated with the project would be eliminated.

Cumulative Impacts

There are past and continuing safety risks for park staff and researchers using helicopters to access research and monitoring plots, archeological survey sites, weather stations, and other backcountry installations. There are inherent safety risks associated with cross country snowmachine travel through the Preserve in winter. Such activities have minor adverse cumulative impacts on safety. NPS-maintained emergency cabins mitigate this winter safety risk somewhat. Alternative B would contribute minor adverse cumulative impacts on safety. Combined with known past, current and future projects and actions, there would be minor adverse cumulative impacts on safety.

Conclusion

Alternative B would result in minor, long-term, direct, local, adverse impacts on safety from risks of snowmachine and helicopter accidents over the course of the project.

5.0 CONSULTATION & COORDINATION

5.1 PUBLIC INVOLVEMENT

This environmental assessment is available for public review and comment for 30 days. It is available online at the National Park Service Planning, Environment, and Public Comment (PEPC) website. Go the <http://parkplanning.nps.gov> to access the PEPC site. Public comments on this environmental assessment can also be made on the PEPC website during the public comment period.

A press release announcing the public comment period and availability of the environmental assessment was issued by the NPS.

5.2 LIST OF PREPARERS AND CONSULTANTS

U.S. Department of the Interior, National Park Service

Peter Neitlich, Project Manager, WEAR Acting Chief of Natural Resources / Ecologist
Jim Lawler, ARCN Inventory & Monitoring Program Manager
Ken Adkisson, Subsistence Manager
Dick Anderson, Project Environmental Compliance Coordinator
Glen Yankus, Regional Environmental Protection Specialist
Adrienne Lindholm, Regional Wilderness Program Manager
Jeanette Pomrenke, BELA Superintendent
Frank Hays, WEAR Superintendent

The Mangi Environmental Group

Eveline Martin, Project Manager and Environmental Analyst
Phil Sczerzenie, Wildlife Analyst

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APPENDIX A: ANILCA SECTION 810(A)

SUMMARY EVALUATION AND FINDINGS

I. Introduction

Title VIII, Section 810 of the Alaska National Interest Lands Conservation Act (ANILCA) requires Federal agencies having jurisdiction over lands in Alaska to evaluate the potential impacts of proposed actions on subsistence uses and needs. This analysis evaluates the potential restrictions to ANILCA Title VIII subsistence uses and needs that could result should the National Park Service (NPS) study the effects of reindeer grazing and allow construction of 18, fenced 30 ft x 30 ft square enclosures in Bering Land Bridge National Preserve (BELA). The NPS is granted broad statutory authority under various acts of Congress to manage and regulate activities in areas of the National Park System, (16 U.S.C. 1a-2(h), 3, and 3120).

II. The Evaluation Process

Section 810(a) of ANILCA states:

In determining whether to withdraw, reserve, lease, or otherwise permit the use, occupancy, or disposition of public lands . . . the head of the Federal agency . . . over such lands . . . shall evaluate the effect of such use, occupancy, or disposition on subsistence uses and needs, the availability of other lands for the purposes sought to be achieved, and other alternatives which would reduce or eliminate the use, occupancy, or disposition of public lands needed for subsistence purposes. No such withdrawal, reservation, lease, permit, or other use, occupancy or disposition of such lands which would significantly restrict subsistence uses shall be effected until the head of such Federal agency

(1) gives notice to the appropriate State agency and the appropriate local committees and regional councils established pursuant to Section 805;

(2) gives notice of, and holds, a hearing in the vicinity of the area involved; and

(3) determines that (A) such a significant restriction of subsistence uses is necessary, consistent with sound management principles for the utilization of the public lands, (B) the proposed activity would involve the minimal amount of public lands necessary to accomplish the purposes of such use, occupancy, or other disposition, and (C) reasonable steps would be taken to minimize adverse impacts upon subsistence uses and resources resulting from such actions.

Section 201 of ANILCA created new units of the national park system in Alaska for the following purposes:

Bering Land Bridge National Preserve, containing approximately two million four hundred and fifty-seven thousand acres of public land, was created by ANILCA, section 201(2) for the following purposes:

To protect and interpret examples of arctic plant communities, volcanic lava flows, ash explosions, coastal formations and other geologic processes; to protect habitat for internationally significant populations of migratory birds; to provide for archeological and paleontological study, in cooperation with Native Alaskans, of the process of plant and animal migration, including man, between North America and the Asian Continent, to protect habitat for, and populations of, fish and wildlife including, but not limited to, marine mammals, brown/grizzly bears, moose and wolves; subject to such reasonable regulations as the Secretary may prescribe, to continue reindeer grazing use, including necessary facilities and equipment, within the areas which on January 1, 1976, were subject to reindeer grazing permits, in accordance with sound range management practices; to protect the viability of subsistence resources; and in a manner consistent with the foregoing, to provide for outdoor recreation and environmental education activities including public access for recreational purposes to the Serpentine Hot Springs area. The Secretary shall permit the continuation of customary patterns and modes of travel during periods of adequate snow cover within a one-hundred-foot right-of-way along either side of an existing route from Deering to the Taylor Highway, subject to such reasonable regulations as the Secretary may promulgate to assure that such travel is consistent with the foregoing purposes.

GENERAL ADMINISTRATION

Among other general administrative provisions, section 203 of ANILCA states, "Subsistence uses by local residents shall be allowed in national preserves and, where specifically permitted by this Act, in national monuments and parks."

The potential for significant restriction must be evaluated for the proposed action's effect upon "... subsistence uses and needs, the availability of other lands for the purposes sought to be achieved and other alternatives which would reduce or eliminate the use." (Section 810(a))

III. Proposed Action on Federal Lands

The following is a brief summary of the proposed alternatives considered in Chapter 3 of the environmental assessment (EA):

Alternative A - No-Action (Environmentally Preferred Alternative)

Under Alternative A, the NPS would not construct the grazing enclosure fences in BELA. The winter range vegetation plots would continue provide biologist with information on vegetation changes within the study area. Alternative A causes the least damage to the biological and physical environment and best protects, preserves, and enhances historic, cultural, and natural resources (40 CFR 1505.2 Q6a). For these reasons the NPS identifies Alternative A (No-Action) as the environmentally preferred alternative. This alternative represents a continuation of the

existing situation and provides a baseline for evaluating the changes and impacts of the proposed action alternative.

Alternative B - (NPS Preferred)

Under Alternative B, the NPS would conduct a grazing impact study in 6 areas within BELA. In each study area the NPS would construct three, 30 ft x 30 ft free-standing chain link fence enclosures. Each study area enclosure would be constructed using 10 ft x 6 ft standard fencing panels clamped together.

The NPS would utilize helicopter access to support construction, maintenance, monitoring and enclosure removal activities. In planning flight paths, all feasible measures would be undertaken to avoid and/or minimize impacts to backcountry users. Planned flight routes would be approved by the park superintendent. Travel routes would be as efficient as possible to minimize flights over conflict areas. Helicopter and aircraft altitude and horizontal distances would be maintained according to the park policy. To reduce adverse noise impacts to recreational users and wildlife in BELA, helicopters would maintain a minimum altitude of 2,000 to 2,500 feet above ground surface, other than during the initial phase of slinging the fencing material into the site, during landing and takeoff, or when visibility is limited by cloud cover, pursuant to Federal Aviation Administration (FAA) Advisory Circular (AC91-36C), "Visual Flight Rules (VFR) Near Noise Sensitive Areas."

IV. Affected Environment

Subsistence uses, as defined by ANILCA, Section 810, means "The customary and traditional use by rural Alaska residents of wild, renewable resources for direct personal or family consumption as food, shelter, fuel, clothing, tools, or transportation; for the making and selling of handicraft articles out of non-edible byproducts of fish and wildlife resources taken for personal or family consumption; for barter, or sharing for personal or family consumption; and for customary trade." Subsistence activities include hunting, fishing, trapping, and collecting berries, edible plants, and wood or other materials.

A summary of the affected environment pertinent to subsistence uses is presented here.

BELA contains approximately 2,784,960 acres (96% of which is federally owned) and is located in northwestern Alaska about 500 miles northwest of Anchorage and occupies about one-third of the Seward Peninsula. It has a gradient of landforms from coastal plain along the northern coast rising to a central plateau, and bordered in the south by a mountain range.

The climate shows both maritime and continental influences and is strongly affected by whether or not the surrounding maritime waters are frozen over or are ice-free, generally mid-June to early November.

Over 350 vascular plants and 60 lichens have been collected from the preserve. Brackish/salt marsh grasslands occur in estuaries and around lagoons with drier grasslands on sandy seashore dunes. Wet tundra is common throughout the coastal lowlands with moist tundra on drier hills

and slopes. Moist tundra predominates throughout the uplands of the plateau and foothills generally as tussock grass but with shrubs in patches and thickets along river courses. Alpine tundra predominates in the mountainous areas. Willow, alder and birch make up some of the more noticeable shrub thickets. The preserve's varied habitats support a rich avifauna and some 180 species have been collected in or around the preserve.

The marine/estuarine habitats along with extensive freshwater lakes and ponds support large populations of migratory geese, ducks, and shorebirds. Varied tundra habitats especially in the uplands support the majority of the preserve's passerine birds.

NPS qualified subsistence users are eligible to harvest fish and wildlife in BELA under the Federal Subsistence Program regulations. Important large mammals include Brown bear, moose, caribou, and muskox. Furbearers include wolf, wolverine, red and arctic foxes, beaver, muskrats, arctic ground squirrels. While the preserve does not actually contain offshore marine waters, those waters contain a diverse group of marine mammals many of which are important for subsistence. These include polar bear, bowhead whale, beluga whale, walrus, bearded seal, and several smaller seals such as spotted and ringed seals. Some of the seals use islands (part of the preserve) in the Cape Espenberg area as well as Espenberg beaches as haul out areas.

Comprehensive descriptions of the affected subsistence environment within the EA and in:

- "Bering Land Bridge National Preserve, General Management and Land Protection Plan. (See online at [http:// www.nps.gov](http://www.nps.gov))
- Alaska Department of Fish and Game General and Subsistence Harvest Information and Publications (See online at <http://www.state.ak.us/adfg>)
- Federal Subsistence Management Regulations, Office of Subsistence Management, FWS, (See on line at <http://alaska.fws.gov/asm/home.html>)
- National Park Service Management Policies, NPS, 2006. Information and Publications (See online at [http:// www.nps.gov/policy](http://www.nps.gov/policy))
- Alaska Subsistence, NPS Management History, NPS 2002
- Code of Federal Regulations, Part 13 National Park System Units in Alaska

The NPS recognizes that patterns of subsistence use vary from time to time and from place to place depending on the availability of wildlife and other renewable natural resources. A subsistence harvest in a given year may vary considerably from previous years because of weather, migration patterns, and natural population cycles.

V. Subsistence Uses and Needs Evaluation

Potential Impacts to Subsistence Users

To determine the potential impacts on existing subsistence activities for the proposed action, three evaluation criteria were analyzed relative to existing subsistence resources.

- the potential to reduce important subsistence fish and wildlife populations by (a) reductions in number, (b) redistribution of subsistence resources, or (c) habitat losses;
- what affect the action might have on subsistence fisherman or hunter access;
- the potential for the action to increase fisherman or hunter competition for subsistence resources.

1. The potential to reduce populations:

(a) Reduction in Numbers:

The proposed action is not expected to cause a significant decline of wildlife species in the affected areas.

(b) Redistribution of Resources:

The proposed action is not expected to cause a significant displacement of subsistence resources in the affected areas.

(c) Habitat Loss:

The proposed action is not expected to be beneficial for maintaining preferred habitat for key subsistence resources within the affected areas. The proposed action is not expected to provide a negative effect on distribution, densities and availability of subsistence resources.

Impacts to subsistence resources and habitat from the proposed action are not expected to have adverse effects on subsistence uses. The NPS would work closely with subsistence users to minimize impacts to subsistence resources in the affected area.

2. Restriction of Access:

The proposed action is not expected to significantly restrict current subsistence use patterns. Access for Title VIII subsistence uses within NPS areas is permitted according to Federal and State law and regulations.

3. Increase in Competition:

The proposed action is not expected to significantly restrict or increase competition for ANILCA Title VIII subsistence resources on Federal public lands within the affected area.

VI. Availability of Other Lands

The proposed action is consistent with NPS mandates in NPS areas in Alaska.

VII. Alternatives Considered

No other alternatives were identified that would reduce or eliminate the use of NPS public lands needed for subsistence purposes.

VII. Findings

This analysis concludes that the proposed actions will not result in a significant restriction of subsistence uses.

APPENDIX B: WILDERNESS MINIMUM REQUIREMENT ANALYSIS

MINIMUM REQUIREMENTS ANALYSIS

Bering Land Bridge National Preserve (BELA)
Grazing Enclosures
Project Leader: Peter Neitlich

1.0 PROPOSED ACTION

In support of the Arctic Network (ARCN) of the Inventory and Monitoring Program, the National Park Service would establish 18 grazing enclosures in eligible wilderness. Each enclosure would be 30'x30' and made of 10'x6' pre-made chain-link fence panels. The enclosures would sit on the ground with no surface disturbance. Paired permanent vegetation plots would be established inside and outside the enclosures.

The NPS would use helicopter access. There would be two sling load trips of fence panels plus one crew ferry for set up and to record vegetation plots for each enclosure location, about 18 days of helicopter use in 2012 (one day per enclosure). There would be one helicopter landing per site every 10 years for veg plot data collection. If any enclosures were damaged additional flights may be needed to conduct repairs. After 30-50 years, approximately 18 days of helicopter use would be needed to remove the fence panels.

1.1 Purpose and Need

The NPS is responsible for issuing reindeer grazing permits and for managing the reindeer grazing on preserve lands. Six grazing allotments are in the Preserve, and all include lands outside the Preserve (See Table 1-1 and Figure 1-2 in the EA). Four of these allotments have current NPS grazing permits, for 1,000 reindeer each. The 10-year average herd size is approximately 500 reindeer in 3 of these allotments and 0 in 1 allotment. The 2 allotments without current NPS permits have 10-year average herd size of 0. The current demand for reindeer grazing is low because the western arctic caribou herd seasonally occupies much of the Preserve, and if reindeer are out in the range they will typically join the large caribou herd and be lost to the herder. If the western arctic caribou herd becomes significantly reduced, or if it changes migratory behavior and no longer enters the Preserve, then the reindeer herding use would be expected to increase in the Preserve.

A BELA grazing management plan is needed. Permitted numbers of reindeer should be based on the best available science so grazing impacts should be well understood. Desired future condition of the vegetation on the reindeer range should be determined in the grazing management plan and should be science based. Currently, NPS has little basis for setting reindeer numbers based on vegetation condition. While ARCN has a baseline for vegetation

community structure, grazing endpoints have not been determined. See section 1.1 (Purpose and Need) of the EA for more detail.

2.0 IMPACTS TO WILDERNESS

2.1 Impacts to Wilderness Character

2.1.2 Untrammeled means that wilderness is essentially unhindered and free from modern human control or manipulation. BELA has very few human controls or manipulations.

The project would control and manipulate 30'x30' areas of land inside each of the 18 ungulate enclosures.

2.1.2 Natural means that wilderness ecological systems are substantially free from the effects of modern civilization. BELA has minor perturbations to ecological systems due to reindeer grazing. The wilderness value of naturalness is characterized by vast expanses of rolling tundra, lakes, untamed rivers, and wind-swept coastal barrier dune system.

The project goal is to increase naturalness, to improve grazing management to protect the wilderness ecological system. The project would benefit naturalness.

2.1.3 Undeveloped means that wilderness retains its primeval character and influence, and is essentially without permanent improvement or modern human occupation. The Preserve has existing impacts from grazing structures (fences and corrals), an airstrip, 6 emergency shelter cabins, 4 remote automatic weather stations (RAWS), a radio repeater, and marked vegetation plots. (See BELA Structures and Installations figure)

The project would add 18 structures for grazing management for 30-50 years.

2.1.4 Solitude Primitive and Unconfined Recreation or. The wilderness value of solitude is characterized by nearly 2.7 million acres of the preserve, a broad expanse of tundra that receives infrequent aircraft overflights and occasional winter snowmachine use between villages. The wilderness value of primitive recreation is characterized by the fact that there are very few camping facilities in the preserve and camping is a random, unstructured event.

The project would affect solitude from the helicopter access. The flights would decrease solitude for anyone on the ground. Human activity when the crew sets up the enclosures or reads the vegetation plots would also affect solitude. This would be a temporary impact. The project would not affect unconfined recreation.

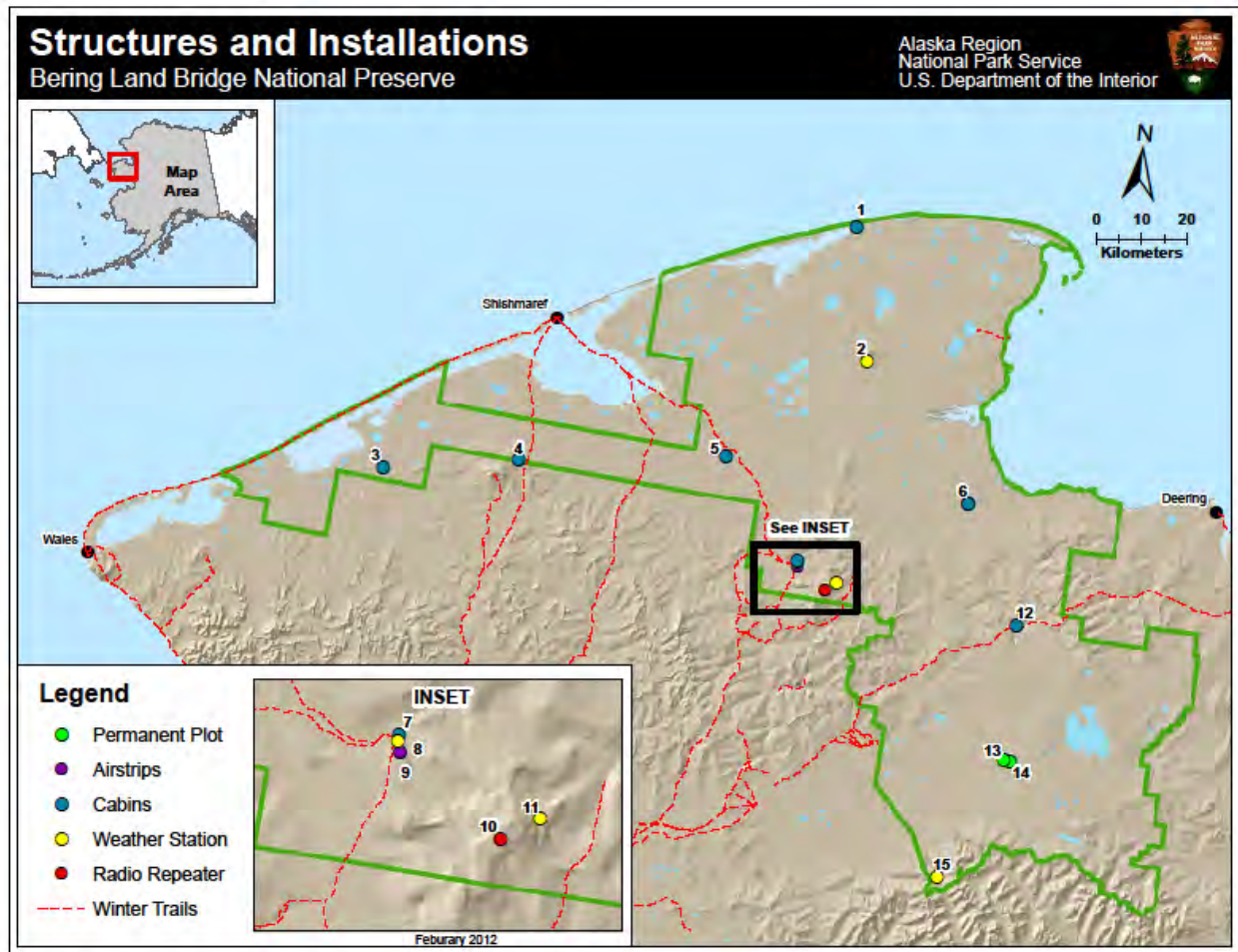


Figure A. Existing Structures and Installations

2.2 Impacts Due to Prohibited Uses

- Structure or installation impacts would occur at 18 locations for 30-50 years.
- Landing of aircraft impacts would occur over 18 days each 10 years.

2.2.1 Exceptions to Prohibited Uses

- Existing Private Rights – None apply. The herders may have reindeer grazing rights due to reissued permits, but the NPS does not have an existing private right to install exclosures structures.
- Special Provisions in the Wilderness Act – None apply. Section 4(d)(4)(2) of the Wilderness Act states that grazing shall be permitted to continue. This section does not address agency facilities used to monitor that grazing. This section addresses national forests and does not apply to NPS.

- Special Provisions in ANILCA or other Federal Legislation – None apply. ANILCA Section 201(2) establishes the new area of BELA. It mentions that BELA is to continue reindeer grazing use, including necessary facilities and equipment, in accordance with sound range management practices. One could interpret “necessary facilities” to include NPS vegetation monitoring facilities like grazing enclosures, if they were determined to be necessary for grazing. However, since the enclosures would not directly support grazing use, this interpretation may be weak.
- Necessary to meet Minimum Requirements for the Administration of the Area for the Purpose of the Wilderness Act – The proposed action must be required for the administration of the area, not for successful completion of the project or another goal. This exception relies on the purpose of the Wilderness Act, not the public purposes of the Wilderness Act or the purposes of the Preserve. The use of this exception requires a superintendent’s determination that each prohibited use (installation of enclosures and plot markers and landing of helicopters) is necessary to meet minimum requirements for the administration of the area for the purpose of the Wilderness Act.

The proposed action is for the administration of the Preserve as wilderness. It supports the NPS responsibility to manage reindeer grazing. It supports the NPS responsibility to manage that grazing accordance with sound range management practices. The superintendent must either deny the proposal or determine that the actions are required, necessary and minimal.

3.0 PROJECT NECESSITY

3.1 Outside of Wilderness

The project biologists indicated that the installation of enclosures is necessary within the Preserve and cannot be conducted outside. Nearly all of the Preserve is eligible wilderness, so in order to conduct the project outside the wilderness, it would have to be conducted outside the Preserve.

To be able to compare a vegetation plot with no grazing to plots that are grazed, enclosures need to be collocated in the vicinity of the existing permanent vegetation monitoring plots within the landcovers of management interest. In addition, the size of the Preserve (2.7 million acres) makes extrapolation of study results from outside the Preserve to situations within the Preserve problematic due the potentially high degree of environmental variability between study sites.

3.2 Without Prohibited Uses

The project biologists indicated that the project could not be done without the use of helicopters, the installation of enclosures and the installation of vegetation plot markers. The shape and weight of the enclosures make their transport by dog sled, snowmachine or float plane infeasible. If float planes were used, the enclosure fence panels would still need to be hauled to their sites,

and helicopter would be the only feasible mode of transport. The enclosures could be constructed without using motorized equipment.

3.3 Without Impacts to Wilderness Character

The project could not be done without negatively impacting 2 of the 4 statutory qualities of wilderness character. The project could not be done without controlling, or *trammeling*, the areas within the grazing enclosures. The project could not be done without 18 long-term enclosure structures, which constitute *development*. See section 2.5 of the EA, Alternatives Considered but Rejected.

3.4 Policy and Planning

The proposed action may be considered necessary to conform to direction contained in NPS policy and the Preserve's GMP. There is no Preserve Wilderness Management Plan.

Management Policies 8.6.8.2 states: Managers must regulate livestock so that ecosystem dynamics and the composition, condition, and distribution of native plants and animal communities are not significantly altered or otherwise threatened. A comprehensive monitoring program must be implemented, and adaptive management practices must be used to protect park resources.

Determining the ends of the grazing spectrum is necessary to regulate livestock use. The enclosures are the only feasible method to determine this, so this is the link to "necessity." The proposed enclosures are required to regulate livestock use, and are a necessary component of a comprehensive monitoring program.

Management Policies 8.6.8.2.2 states: Appropriate structures may be approved by the NPS and may be allowed in parks when the structures

- are consistent with a livestock management plan or another appropriate management plan;
- are consistent with park purposes and other applicable laws, regulations, or policies; and
- will not cause unacceptable impacts on park resources and values.

It may be argued that the proposed enclosures

- are consistent with another appropriate management plan, the 1986 GMP, in the absence of a livestock management plan;
- are consistent with park purposes – to continue reindeer grazing use, including necessary facilities (ANILCA section 201(2)); and
- would not cause unacceptable impacts on park resources and values, because the motorized (helicopter) use is temporary, and the structures are necessary for range management and will be removed in 30 to 50 years.

Management Policies 6.4.7 states: The construction of livestock management facilities other than those specifically authorized by legislation is prohibited.

3.5 Wilderness Character

The proposed enclosures may be considered necessary to preserve Naturalness, one of the 4 statutory qualities of wilderness character. Wilderness ecological systems are substantially free from the effects of modern civilization. Naturalness may be degraded by the unintended effects of modern people on the ecological system. Overgrazing by reindeer would be an impact on Naturalness. The enclosures would provide information for the effective management of grazing, and therefore, indirectly would protect the natural ecological system.

3.6 Statutory Public Purposes of Wilderness

The proposed enclosures are not *necessary* for the 6 Public Purposes of wilderness -- recreation, scenic, scientific, educational, conservation, and historical use -- but the enclosures are *consistent* with scientific use, conservation use, and possibly historical use.

4.0 SUPERINTENDENT'S DETERMINATION

4.1 Determination of Minimum Requirement

The proposed action includes statutory prohibited uses – the landing of aircraft, and the creating the presence of structures or installations. The proposed action seeks to use the Minimum Requirements Exception from 4(d) of the Wilderness Act. Therefore, the superintendent must determine that each occasion of prohibited use is necessary to meet minimum requirements for the administration of the area for the purpose of the Wilderness Act, or those occasions without such determination must be denied.

4.2 Determination of Necessity

Based on the information sections above, the superintendent must determine that the proposed action (the entire project) is legal, necessary and appropriate in wilderness, or the project must be denied.

5.0 MINIMUM ACTIVITY

5.1 Alternatives

There is only one action alternative. No other alternatives have been determined to be acceptable or feasible. Aspects of the project that would benefit wilderness are – indirectly increase Naturalness of the ecosystem by providing information which could be used in a grazing management plan which may limit the number of reindeer in a grazing allotment to prevent overgrazing. Currently, we do not know how likely it is that overgrazing would occur, either by reindeer or by caribou, or how to define overgrazing by caribou. Aspects of the project that would impact wilderness are – landing of helicopter for construction, vegetation monitoring every 5-10 years, enclosure repairs as needed, and removal in 30-50 years; and the creation of 18 long-term facilities.

5.2 Other Considerations

The project would support the statutory use of the Preserve for continuing reindeer grazing.

5.3 Determination of Minimum Activity

The selected alternative must be the one with the least impact to the physical resources and experiential qualities (character) of wilderness, but there is only one action alternatives, so a determination cannot be made that one alternative has a greater or lesser wilderness impact than another. The superintendent must determine above whether or not each occasion of prohibited uses is “necessary to meet minimum requirements for the administration of the area for the purpose of the Wilderness Act”. The other 3 classes of exceptions to prohibited uses are not applicable to this project – existing private rights, a special provision of the Wilderness Act, or a provision of other legislation.

5.4 Document the Decision

No superintendent’s decision is needed here because there are no alternatives to compare.

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